Synergy of success

Gazprom Environmental Report 2021

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Message by Mr. Aksyutin

Dear readers!

Oleg E. Aksyutin
Deputy Chairman of the Management Committee – Head of Department, Head of PJSC Gazprom Coordination Committee for Sustainable Resource Management

I am pleased to welcome you from the pages of our annual Environmental Report.

In 2021, Gazprom once again established a record with 514.8 billion cubic meters of natural gas produced. This is the highest achievement over the last 13 years, which demonstrates Gazprom's leadership on the global energy market. We beat the targets related to gasification of the Russian regions in 2021, and confronted all present-day challenges. We are sustainably on-stream and constantly advancing to guarantee energy security and fulfill incurred environmental commitments.

Natural gas is the most green energy resource. It provides the most feasible route to mitigate negative environmental impact and decarbonise economy. Gazprom implements modern practices of the best available techniques and innovative technologies to reduce negative impact on the environment and protect it, incrementally upgrades its energy efficiency, and cuts carbon footprint of its products.

The Gazprom Group is consistently advancing its environmental performance. Over the last five years, the Company reduced water consumption by 14%, pollutant emissions by 10%, waste generation by 26%. The year 2021 saw achievement of all set Corporate Environmental Goals.

During the last five years, we invested RUB 160 bln in environment protection. In 2021, Gazprom initiated and implemented more than 3,200 voluntary nature conservation measures in Russian regions, including tree planting, settlements improvement, landscaping, and reclamation of water bodies.

Gazprom's leadership status in information disclosure with regard to nature conservation, sustainable development, corporate responsibility and reporting are the facts in support of the Company's path to transparency.

The Gazprom Group companies have been routinely ranked high in environmental ratings.

In the perspective of the 2050 Strategy of Social and Economic Development of the Russian Federation with Low Level of Greenhouse Gas Emissions, PJSC Gazprom develops its 2050 Sustainable Development Scenarios with due regard to the low-carbon trend in the global economy.

Public interests and preservation of the favorable environment for today's and future generations is a top priority for Gazprom, which keeps guard over energy security at the forefront of the current-day challenges.

Introduction

The present Environmental Report (henceforth – the Report) has been prepared in accordance with PJSC Gazprom's Management Committee Resolution on Organization and Holding of the annual General Shareholders Meeting of Gazprom.

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 of PJSC Gazprom's subsidiaries and organizations, corporate websites, Russian and international publications by the Group's companies.

The Report highlights EP and energy efficiency activities of the Gazprom Group companies in 2021, including actual impact on air, water and land resources, waste management, greenhouse gas (GHG) emissions, and measures undertaken to mitigate such an impact.

The Report specifies the issues of EP management and financing arrangements, research and technology upgrade of the industrial complex aimed at enhancing environmental safety of the Gazprom Group's facilities.

Data are provided for the Gazprom Group in general, PJSC Gazprom (including five-year retrospective data) and for some companies from the Group that significantly contribute to reviewed issues 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 Urengoy
OOO Gazprom dobycha Yamburg
OOO Gazprom dobycha shelf Yuzhno-Sakhalinsk
OOO Gazprom nedra
OOO Gazprom transgaz Ekaterinburg
OOO Gazprom transgaz Grozny
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 Tchaikovsky
OOO Gazprom transgaz Tomsk
OOO Gazprom transgaz Ufa
OOO Gazprom transgaz Ukhta
OOO Gazprom transgaz Volgograd
OOO Gazprom transgaz Yugorsk
OOO Gazprom pererabotka
OOO Gazprom UGS
OOO Gazprom NGHK
OOO Gazprom energo
OOO Gazprom geotekhnologii
OOO Gazprom gazomotornoye toplivo
OOO Gazprom avia Aviation Company
OOO Gazpromtrans
OOO Gazprom flot
OOO Gazprom invest
OOO Gazprom sotsinvest
AO Gazprom trubinvest

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, AO Gazprom teploenergo).

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 Gazprom 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 (AO Gazprom dobycha Tomsk), AO Daltransgaz, Sakhalin Energy Investment Company Ltd, OAO Severneftegazprom, ZAO Purgaz, PAO Spetsgazavtotrans.

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

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 favorable environment for future generations.

PJSC Gazprom's Environmental Policy approved by PJSC Gazprom Management Committee's Decree No. 21 as of 25 May 2015 is a fundamental document of the Environmental Management System (EMS).

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

The Company's Environmental Policy features current trends in environmental protection, energy efficiency and climate impact mitigation. 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 conducted in 2021 acknowledged PJSC Gazprom's EMS conformance to ISO 14001:2015.

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, EP and sustainable development. The Committee comprises the majority of the Management Committee members and the heads of PJSC Gazprom's Administration structural divisions.

Teamwork of PJSC Gazprom's subsidiaries and organizations on EP 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)
- natural gas and gas condensate processing
- natural gas and gas condensate transportation
- underground gas storage
- geological exploration
- well construction, stimulation and repair, including offshore
- construction and operation of offshore drilling rigs, dedicated fleet and other floating equipment
- development and operation of offshore fields, onshore supply bases and port infrastructure
- power and water supply and operation of UGSS power equipment
- investment project management for UGSS facilities construction.

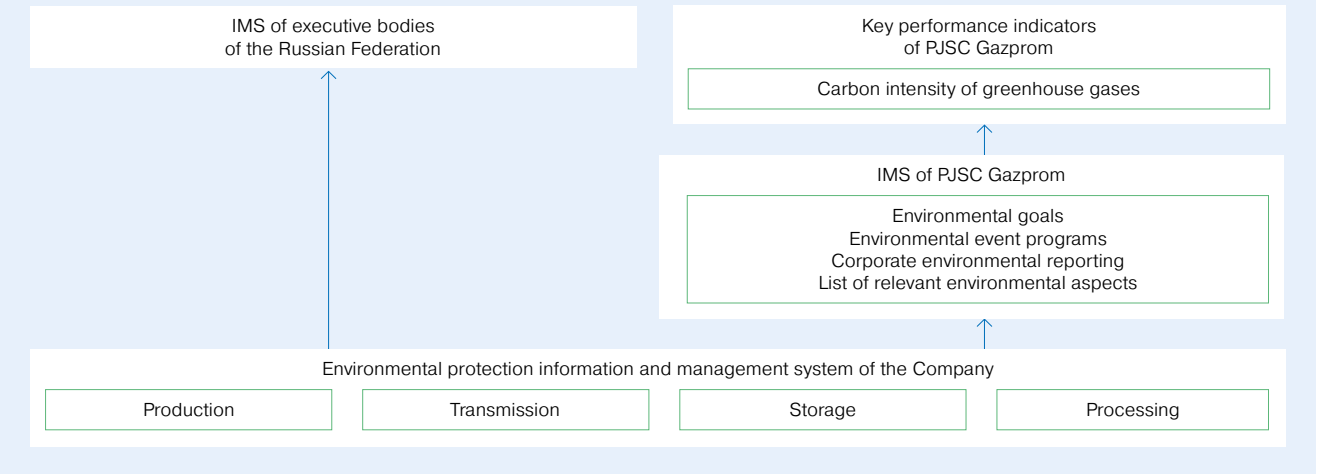
PJSC Gazprom's EMS applies to structural divisions of the Administration, 37 subsidiaries with 100% ownership involved in key activities, the Corporate R&D Center for Environmental Safety and Energy Efficiency of Gazprom VNIIGAZ LLC, and PJSC Gazprom's Environmental Inspectorate.

The Gazprom Group companies outside the boundaries of EMS application have successfully adopted and put into operation individual EMSs, the majority of which is certified for conformance to ISO 14001:2015 requirements. Unique EMSs 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 improve EMS and boost executive decision-making efficiency. The suit comprises the whole sequence of environment protection activities of a vertically-integrated company from collection and processing of industry facilities data to development of summary report forms submitted to corporate and state systems. The software suit has been developed on the basis of the Russian 1C platform within the scope of information & management system development for all key activities of PJSC Gazprom.
In 2021, the Company's information & management system Environmental Management was operated by 22 subsidiaries of PJSC Gazprom in charge for production, transmission, underground storage and processing of natural gas. This measure allowed for minimizing costs for collection, processing and storage of data, EMS maintenance, speeding up report making and monitoring of PJSC Gazprom's environmental key performance indicators.

PJSC Gazprom Information and 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 2021, 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
- The best available techniques and integrated environmental permits
- Relevant requirements and environmental safety issues for the Gazprom Group companies
- Professional work in the system "Ecology. 1C-KSU. Environmental protection".

Professional development programs comprised the following courses:

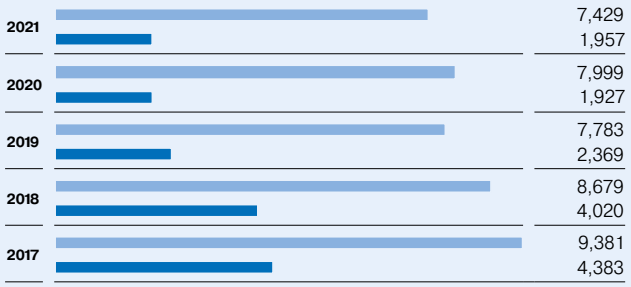
- Environmental management at PJSC Gazprom under "PJSC Gazprom – the large industrial and financial complex" professional development program
- Environmental impact assessment under "Project expertise in gas industry" professional development program.

Throughout the year, a considerable number of the Gazprom Group employees have completed the following training courses by virtue of the remote educational technologies:

- Environmental protection at PJSC Gazprom within online teaching package "E-learning – advancing corporate competences"
- Environmental protection within online teaching package "Corporate culture at PJSC Gazprom".

In 2021, different educational institutions provided environmental training and skill upgrade for 7,429 employees of Gazprom (1,957 of them in the EMS): 5,172 – at PJSC Gazprom and its subsidiaries (1,924 of them in the EMS), 1,296 – at Gazprom Neft Group (4 of them in the EMS), and 672 – at Gazprom energoholding.

Environmental training of the Gazprom Group personnel, 2017–2021, prs



41,271 employees completed environmental training at the Gazprom Group in 2017–2021.

Contest of environmental services and ecologists of PJSC Gazprom subsidiaries

Every year, PJSC Gazprom (according to the Order No. 80 as of 15 February 2021) holds a Contest among environmental services and ecologists of subsidiaries.

OOO Gazprom transgaz Tomsk (Irina A. Verkeeva, head of the Department) won the 2021 Contest among environmental services based on performance in 2020.

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

- Alexander G. Falin – head of the EP Department at the administration of OOO Gazprom dobycha Krasnodar
- Julia V. Grefenshtein – the leading EP engineer at production and engineering division of OOO Gazprom dobycha Urengoy subsidiary, Department for rotational camps management
- Andrey V. Yakin – 1st category EP engineer at the Kamchatsky linear production department of gas trunkline of OOO Gazprom transgaz Tomsk.

Environmental goals and programs

The Gazprom EMS sets its 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 repairs of gas trunklines (GTL), nitrogen oxides emissions during operation of compressor stations (CS), wastewater discharges and waste disposal as well as environmental aspects related to implementation of investment projects.

Sustainable environmentally friendly development of PJSC Gazprom as well as achievement of Corporate Environmental Goals is implemented through PJSC Gazprom's 2020-2024 Comprehensive Environmental Program that envisages a set of measures, among which switching to technology regulation and introduction of the best available techniques. Actions taken in 2021 resulted in achievement of the following PJSC Gazprom's Corporate Environmental Goals set for 2020–2022.

PJSC Gazprom Corporate Environmental Goals for 2020-2022 achieved in 2021

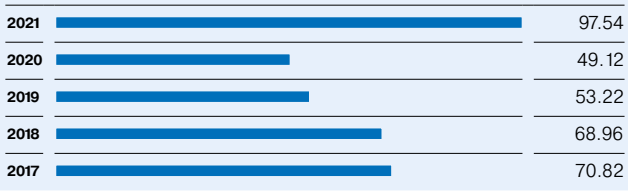
No	Corporate environmental goal	Organizations covered by EMS	Benchmark value (2018)	2021 value	Progress
1	Reduction in GHG emissions during natural gas transmission, t CO_2e / bln m^3·km	All natural gas transmission subsidiaries	55.30	52.25	Achieved
2	Reduction in nitrogen oxides emissions into the atmosphere during natural gas transmission, t / mln m^3	All natural gas transmission subsidiaries	4.23	4.07	Achieved
3	Reduction in limit-exceeding discharge of pollutants into surface water bodies, %	All subsidiaries	5.29	0.12	Achieved
4	Reduction in landfill share from the total share of circulating waste, %	All subsidiaries	38.28	14.26	Achieved
5	Reduction in the share of subsidiaries that surpassed 5% payment for limit-exceeding environmental impact, %	All subsidiaries	35	13.51	Achieved

Environmental financing

In 2021, total expenditures of the Gazprom Group for environmental protection in the Russian Federation almost doubled as compared to 2020 and amounted to RUB 97.54 bln.

The rise was seen in investments in fixed assets aimed at EP and rational use of natural resources. These investments increased more than four times. Such an increase in 2021 investment costs happens simultaneously in all business sectors (gas, oil, electric power), which affected the overall amount for the Gazprom Group.

Dynamics of the Gazprom Group expenditures for EP, 2017-2021, bln RUB



In 2021, the Gazprom Group allocated RUB 97.54 bln for EP that is an all-time high value and is due to an increase in investment costs for EP and rational use of natural resources.

Fixed capital investments in EP and rational use of natural resources, 2017-2021, mln RUB

	2017	2018	2019	2020	2021
The Gazprom Group	**35,584.53**	**29,188.61**	**20,421.32**	**13,987.15**	**60,529.57**
Gas business companies	4,450.87	5,612.57	5,732.34	3,607.24	16,245.96
incl. PJSC Gazprom	2,862.86	5,283.52	5,119.59	1,646.16	14,973.70
Gazprom Neft Group	27,101.67	19,028.63	13,015.56	7,796.72	39,700.79
Gazprom energoholding	579.20	1,374.55	305.69	729.41	3,766.70
Gazprom neftekhim Salavat	3,452.79	3,172.86	1,367.73	1,853.78	816.12

In 2021, investments of gas business companies increased 4.5 times. Over 89% of PJSC Gazprom's investments were made into land protection and rational use. This growth is due to actual accomplishment of construction works and equipment installation in accordance with the construction schedule, including facilities under the project "Engineering landslide protection of the Psekhako ridge northern slope".

Five-time increase in investments channeled in EP and rational use of natural resources at Gazprom neft Group is due to implementation of the Gas Program targeted at atmospheric air protection – RUB 35 bln. Over RUB 3.6 bln (9%) fixed capital investments were made in protection and rational use of water resources, in particular construction of the BOV-7 circulation water system at the Omsk Oil Refinery (OR).

Biological treatment facilities "Biosphera" at the Moscow OR is among the flagship environmental projects of Gazprom neft in oil refining. This equipment brought wastewater treatment efficiency to 99.9%. Construction of such a facility is underway at the Omsk OR. Investments in this project exceed RUB 28 bln.

In 2021, the Gazprom Group made investments into:

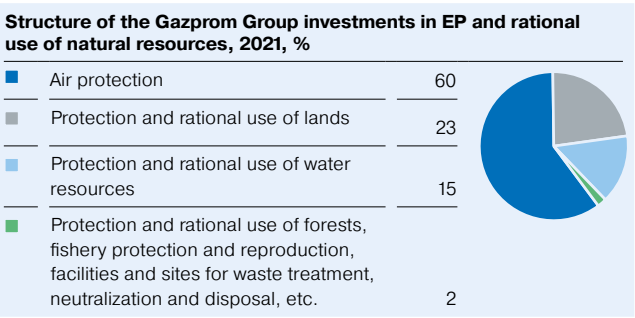
- protection and rational use of water resources – RUB 9,101.84 mln, of which RUB 7,811.70 mln for construction of wastewater treatment facilities and circulation water systems
- air protection – RUB 36,478.22 mln, including increase in APG use
- protection and rational use of lands – RUB 13,634.63 mln, including land remediation – RUB 498.87 mln
- other environmental issues – RUB 1,314.88 mln, including RUB 183.82 mln for fishery protection and reproduction, RUB 703.82 mln for waste recycling, treatment and disposal facilities and sites, RUB 248.96 mln for protection and rational use of forests, others – RUB 178.28 mln.

In 2017–2021, the Gazprom Group invested RUB 159.7 bln into EP and rational use of natural resources.

In the reporting year, the Gazprom Group commissioned: 82 wastewater treatment facilities and structures with a total capacity of 64.44 thousand m^3/day; 12 units for entrapment and neutralization of contaminants from off-gases with a capacity of 87.82 thousand m^3/hour, 6 units for waste neutralization and treatment with a capacity of 10.5 thousand t/year, 5 circulation water systems with a capacity of 225.72 thousand m^3/day.

In 2021, current EP expenditures of the Gazprom Group increased by 5%, as compared to 2020. The reason was the escalation of nature conservation service charges related to protection and reclamation of lands, surface and ground waters, and air as well as prevention of climate change due to increase in expenditures for gas pumping by mobile compressor stations (MCS) to reduce pollutant emissions into the atmosphere.

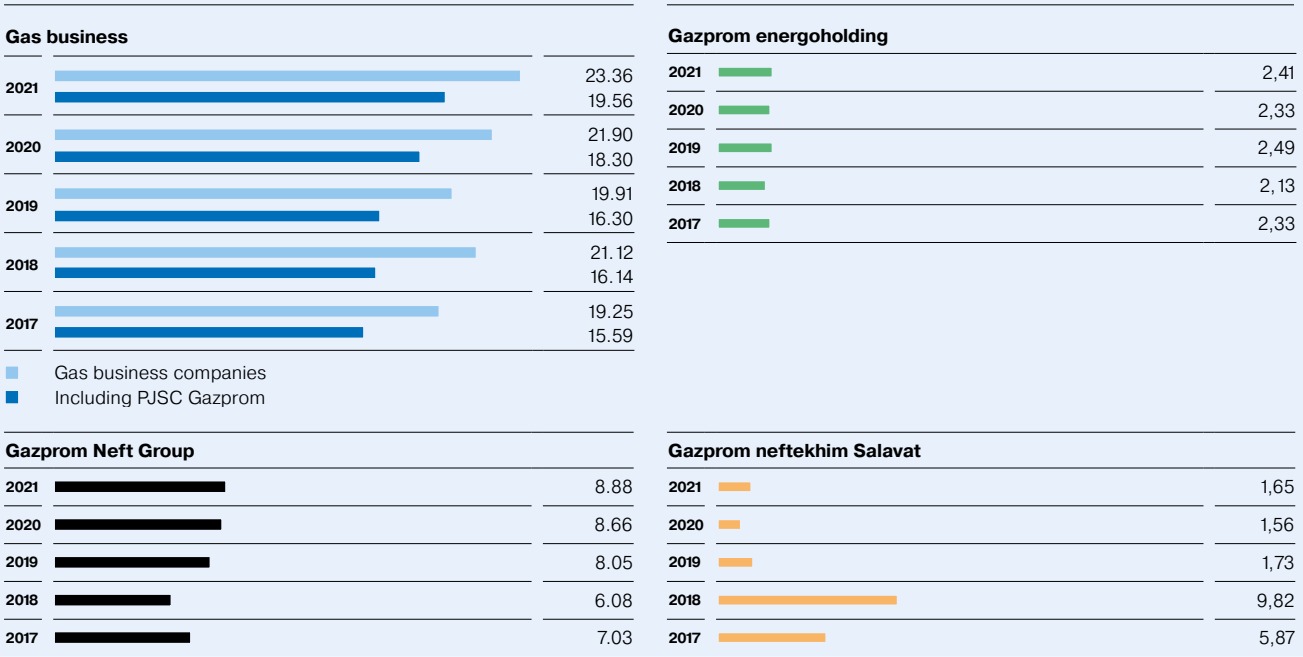
Structure of the Gazprom Group investments in EP and rational use of natural resources, 2021, %



Current EP expenditures, 2017-2021, mln RUB

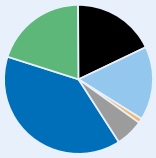
	2017	2018	2019	2020	2021
The Gazprom Group	**34,467.98**	**39,154.34**	**32,180.11**	**34,440.66**	**36,303.25**
Gas business companies	19,246.65	21,124.78	19,909.65	21,899.51	23,362.21
incl. PJSC Gazprom	15,595.46	16,137.67	16,300.29	18,303.85	19,562.22
Gazprom Neft Group	7,027.52	6,080.42	8,053.81	8,655.44	8,877.77
Gazprom energoholding	2,325.85	2,132.36	2,486.13	2,329.58	2,412.42
Gazprom neftekhim Salavat	5,867.97	9,816.77	1,730.52	1,556.13	1,650.85
Including current (operating) EP expenditures					
The Gazprom Group	**18,219.75**	**22,638.04**	**14,964.57**	**13,979.38**	**14,765.66**
Gas business companies	10,083.97	10,527.75	10,431.86	10,472.04	10,935.10
incl. PJSC Gazprom	9,707.42	10,104.97	9,933.54	9,906.52	10,321.74
Gazprom Neft Group	2,520.95	2,527.70	3,088.78	2,262.02	2,596.30
Gazprom energoholding	515.12	613.87	656.20	633.56	573.04
Gazprom neftekhim Salavat	5,099.71	8,968.72	787.73	611.76	661.22
Including current expenditures for EP services					
The Gazprom Group	**14,495.59**	**14,584.14**	**15,601.86**	**18,980.31**	**20,079.41**
Gas business companies	7,854.85	9,226.03	8,530.24	10,701.90	11,810.24
incl. PJSC Gazprom	4,592.33	4,662.63	5,420.37	7,678.02	8,700.84
Gazprom Neft Group	4,387.15	3,225.50	4,673.04	5,984.36	5,764.75
Gazprom energoholding	1,683.04	1,378.41	1,606.82	1,508.39	1,715.75
Gazprom neftekhim Salavat	570.55	754.20	791.76	785.66	788.67
Including current expenditures for overhaul repair of environmental basic production assets					
The Gazprom Group	**1,752.64**	**1,932.16**	**1,613.68**	**1,480.97**	**1,458.18**
Gas business companies	1,307.83	1,371.01	947.55	725.57	616.85
incl. PJSC Gazprom	1,295.71	1,370.07	946.38	719.31	539.65
Gazprom Neft Group	119.42	327.22	291.99	409.06	516.72
Gazprom energoholding	127.69	140.08	223.11	187.63	123.64
Gazprom neftekhim Salavat	197.70	93.85	151.03	158.71	200.97

Dynamics of current EP expenditures at the Gazprom Group, 2017-2021, bln RUB



Wastewater collection and treatment costs routinely prevail in the structure of the Gazprom Group current expenditures. In 2021, these costs amounted to RUB 14.27 bln, or 39.3%. The Gazprom Group spent RUB 7.08 bln on waste treatment, RUB 6.65 bln on protection and reclamation of lands, surface and ground waters; RUB 5.71 bln on air protection and prevention of climate change; RUB 0.27 bln on conservation of biodiversity and protection of natural areas. Expenditures on other environmental protection against noise, vibration and other physical impacts, radiation safety, research and development activities aimed at mitigation of negative impact on the environment, etc. totaled RUB 2.32 bln.

Structure of the Gazprom Group current environmental expenditures, 2021, %



Wastewater collection and treatment	39
Waste management	20
Protection and reclamation of lands, surface and ground waters	18
Air protection and prevention of climate change	16
Conservation of biodiversity	1
Other environmental protection measures	6

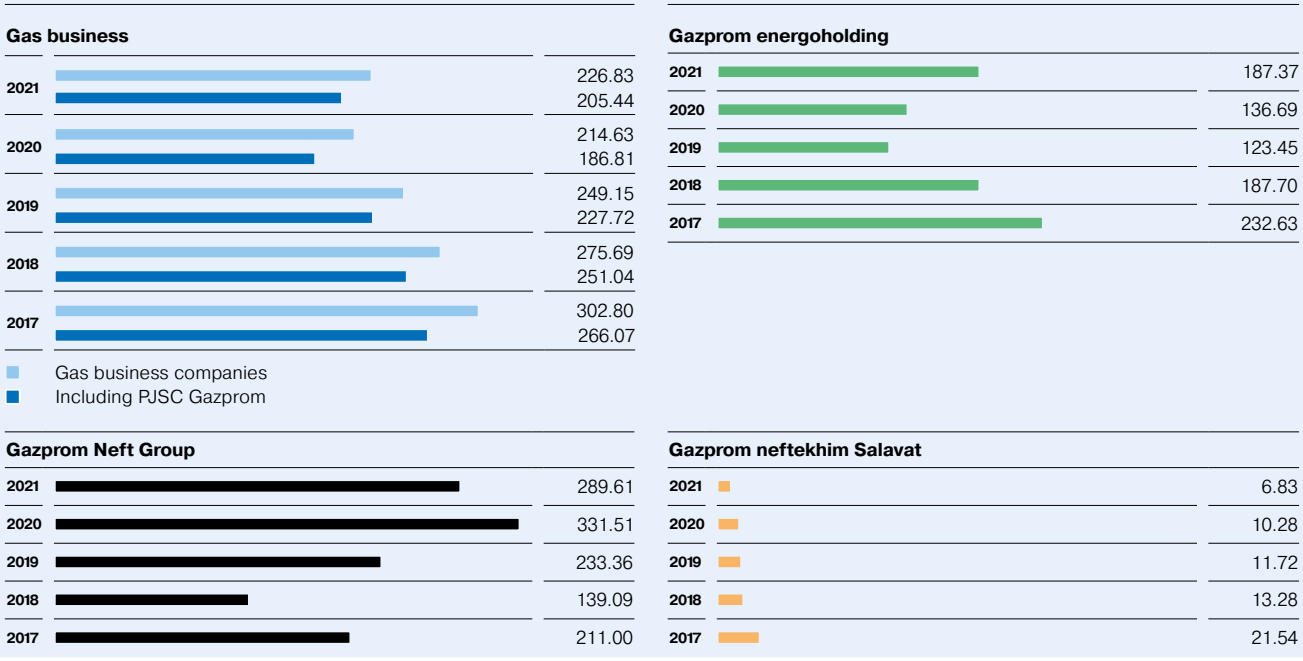
Environmental impact fee

In 2021, the Gazprom Group paid RUB 710.64 mln in environmental impact fee to budgets of different levels.

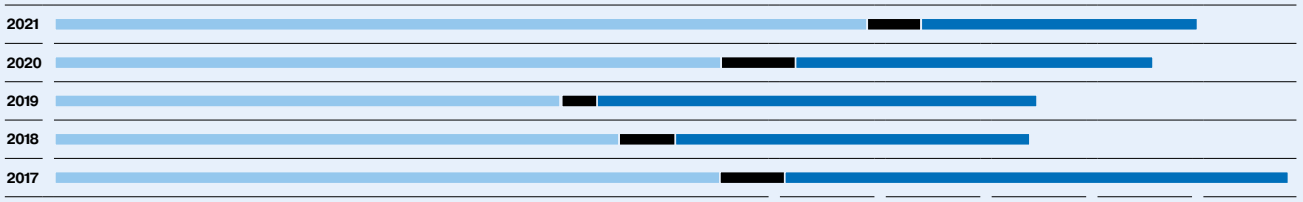
Environmental impact fee, 2017-2021, mln RUB

	2017	2018	2019	2020	2021
Gazprom Group	**767.97**	**615.76**	**617.68**	**693.11**	**710.64**
Gas business companies	302.80	275.69	249.15	214.63	226.83
incl. PJSC Gazprom	266.07	251.04	227.72	186.81	205.44
Gazprom Neft Group	211.00	139.09	233.36	331.51	289.61
Gazprom energoholding	232.63	187.70	123.45	136.69	187.37
Gazprom neftekhim Salavat	21.54	13.28	11.72	10.28	6.83

Environmental impact fee dynamics, the Gazprom Group, 2017-2021, mln RUB



Dynamics of the Gazprom Group environmental fees by types of negative impact on the environment, 2017-2021, mln RUB



	2017	2018	2019	2020	2021
Emissions of pollutants into the atmosphere	412.39	356.94	318.78	419.35	505.28
Discharge of pollutants in water bodies	40.23	35.36	22.49	46.58	33.65
Industrial and consumption waste disposal	315.36	223.46	276.41	227.18	171.71

Fees for emission of pollutants into the atmosphere (71%), and for disposal of industrial and consumption waste (24%) prevailed in the structure of environmental impact fees in 2021.

Environmental limit-exceeding impact fee for the Gazprom Group in general amounted to 48%, PJSC Gazprom – 16%, Gazprom Neft Group – 83%, Gazprom energoholding – 35%, Gazprom neftekhim Salavat – 1%.

Increase in environmental fees and share of limit-exceeding fees in the total sum is mainly due to untimely development of regulatory documentation, and delayed permits for facilities put into service.

Environmental impact indicators

Atmospheric air impact

In 2021, gross pollutant emissions from stationary sources of the Gazprom Group totaled 2,506.31 thousand tons, that is slightly higher than in 2020.

The Gazprom Group dynamics of gross pollutant emissions, 2017-2021, thousand tons

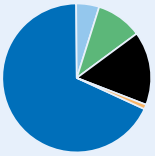
2021	2,506.31
2020	2,445.66
2019	2,862.70
2018	2,894.02
2017	2,795.97

Off-gas decontamination units captured and neutralized 1,146.98 thousand tons of pollutant emissions of which 1,037.08 thousand tons at Gazprom energoholding, 100.24 thousand tons at PJSC Gazprom, 9.66 thousand tons at other Group's companies.

Solid particles, predominantly solid fuel ash of power facilities, constitute 90% of the total weight of captured and neutralized pollutants, while 10% goes for gaseous and liquid substances (93% of which is sulphur dioxide).

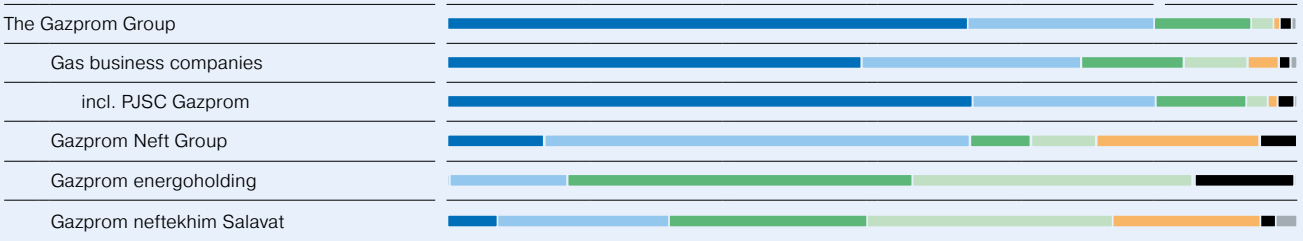
Share of the Gazprom Group companies in gross air emissions, 2021, %

PJSC Gazprom	68
Other gas business companies	5
Gazprom energoholding	10
Gazprom Neft Group	16
Gazprom neftekhim Salavat	1



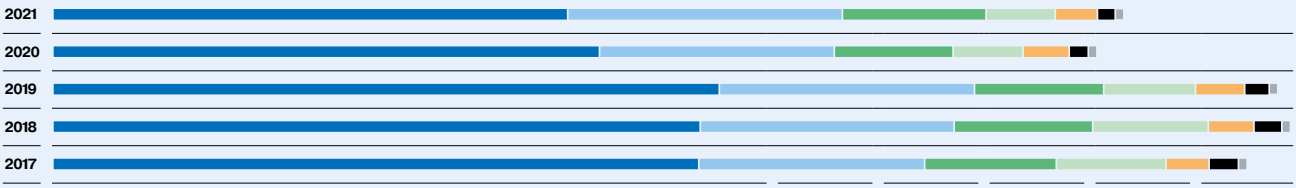
The structure of the Gazprom Group emissions is determined by specifics of operating activities of PJSC Gazprom and other gas business companies. Main pollutants of Gazprom's gross emissions comprise hydrocarbons (including methane), carbon oxide, nitrogen oxides, sulphur dioxide. Emissions of solid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

Component structure of pollutant emissions at the Gazprom Group, 2021, thousand tons, %



	The Gazprom Group	Gas business companies	Including PJSC Gazprom	Gazprom Neft Group	Gazprom energoholding	Gazprom neftekhim Salavat
Hydrocarbons (including methane)	1,193.49	1,145.14	1,053.55	46.82	0.26	1.27
Carbon oxide	642.07	398.96	387.63	202.45	33.46	7.20
Nitrogen oxides	341.60	207.99	200.19	29.42	96.47	7.72
Sulphur dioxide	169.72	50.05	50.01	31.21	78.39	10.07
Volatile organic compounds	107.82	23.76	17.49	77.90	0.28	5.88
Solid particles	50.05	3.59	2.85	18.09	28.04	0.33
Other gaseous and liquid substances	1.56	0.60	0.39	0.18	0.02	0.76

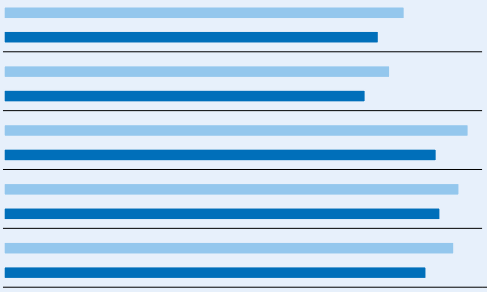
Dynamics of the main pollutant emissions from the Gazprom Group stationary sources, 2017-2021, thousand tons



	2017	2018	2019	2020	2021
Hydrocarbons (including methane)	1,495.67	1,497.78	1,542.64	1,266.42	1,193.49
Carbon oxide	529.92	594.10	596.42	550.66	642.07
Nitrogen oxides	313.57	328.62	307.71	284.22	341.60
Sulphur dioxide	262.66	276.16	221.46	171.97	169.72
Volatile organic compounds	109.85	116.23	124.76	117.22	107.82
Solid particles	79.31	75.00	67.47	53.57	50.05
Other gaseous and liquid substances	4.99	6.13	2.24	1.60	1.56

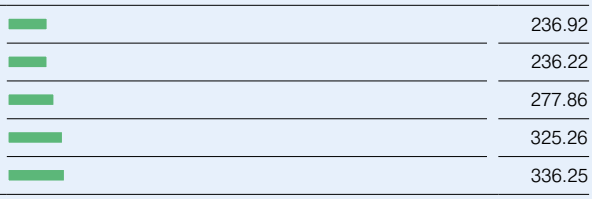
Dynamics of gross emissions at the Gazprom Group, 2017-2021, thousand tons

Gas business



Gas business companies
Including PJSC Gazprom

Gazprom energoholding



Gazprom Neft Group

Gazprom neftekhim Salavat

Pollutant emissions from stationary sources of the Group's gas business companies totaled 1,830.09 thousand tons that is slightly higher as compared to 2020. PJSC Gazprom's share in the general volume of gas business emissions totaled 94%, and determined the common indicators trend.

Gross emissions at Gazprom energoholding and Gazprom neftekhim Salavat did not undergo significant changes as compared to the previous reporting period.

Gross emissions increase of 4% at Gazprom Neft Group as compared to the previous reporting period is driven by growth in the volume of burned APG and natural gas during hook-up and commissioning of new facilities.

As compared to 2020, in 2021 PJSC Gazprom's total gross emissions increased by 59.82 thousand tons or 3.6%. The main reason for that is commissioning of new facilities at the Chayandinskoye OGCF, Bovanenkovskoye OGCF and Gubkinskoye GF, and upturn in the gas transmission. In 2021, at the same time gross emissions decreased by 13.5% against 2017-2019 average emissions thanks to energy-saving activities.

Gross emissions by the type of PJSC Gazprom main activities, 2017-2021, thousand tons

	2017	2018	2019	2020	2021
PJSC Gazprom	**1,951.07**	**1,991.41**	**1,998.23**	**1,652.29**	**1,712.11**
Production	135.30	135.35	146.58	150.56	172.43
Transmission	1,648.55	1,683.16	1,677.52	1,334.96	1,377.75
Underground gas storage	22.34	23.69	21.17	21.92	27.83
Processing	137.18	141.45	144.62	136.97	124.96
Other types of activities	7.70	7.76	8.34	7.88	9.14

Subsidiary companies of Gazprom hold a large number of environmental campaigns aimed at emissions reduction. Energy-saving projects based on the cutting-edge technologies targeted at natural gas savings during repairs make significant contribution into emissions reduction. MCS are among the most effective modern technologies that prevent natural gas emissions typical for conventional repair methods. When preparing to repair works with the use of MCS, the bulk volume of gas from the isolated pipeline section is pumped into the section in service or a parallel line. By doing so, up to 80% of methane emissions are prevented. In 2021, blowing off 744.7 mln m^3 of natural gas into the atmosphere was prevented thanks to MCSs. In the reporting year, the MCS project carried out by a special purpose company OOO Gazprom MCS got into top gear and operated 10 MCSs.

In 2021, the Company decided to increase its MCS fleet by one and a half times (up to 15 units) to employ it during trunkline repairs.

Gas producing subsidiaries carry out well logging without releasing natural gas into the atmosphere by using telemetry systems, concentric tubing for the wells, and multi-component surfactants that improve conditions for removing formation fluid from bottomhole, and thus reduce natural gas emissions.

Utilization of associated petroleum gas

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

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

In 2021, APG effective use factor at the fields of PJSC Gazprom's gas producing subsidiaries (including AO Gazprom dobycha Tomsk) totaled 99.1%, Sakhalin Energy – 97.5%.

In 2021, APG effective use factor at PJSC Gazprom totaled 99.1%.

As for Gazprom Neft Group, the actual value in 2021 for operating assets totaled 89.5%. The real growth in APG production volumes amounted to 3.9 bln m^3 (+22%). APG production and utilization growth is due to:

- production growth at the cluster of the Urmano-Archinskaya fields of OOO Gazpromneft-Vostok
- production growth through commissioning of new wells at the Tazovskoye OGCF of OOO Meretoyakhaneftegaz
- oil production growth at the Pestsovoye, Yen-Yakhinskoye, Zapadno-Tarkosalinskoye, Orenburgskoye and Chayandinskoye fields of OOO Gazpromneft-Zapolyarye.

Investment projects completed during the last 10 years facilitated development of different means of gas utilization by Gazprom Neft Group. These means comprise transmission and delivery of APG to gas processing plants and the Unified Gas Supply System of Russia, processing, generation of heat and electricity for own needs, injection into the gas cap to maintain formation pressure.

Over the last 5 years, Gazprom Neft Group's portfolio of gas program projects resulted in 13.3% effective use of APG. Key factors that stand behind this growth – successful management of product flows and equipment, commissioning of new infrastructure facilities of Gazprom Neft.

Gazprom Neft developed a unit for useful fractionation of associated petroleum gas. This equipment not only contributes into commercialization of all hydrocarbon production output, but also reduces carbon dioxide emissions by 7%. The first process complex successfully tested and was put in service at facilities in the Orenburg region.

APG utilization dynamics at the Gazprom Group companies, 2017–2021, %

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 2021, the Gazprom Group companies withdrew (took) 3,898.24 mln m^3 of water for supply purposes that is 20% higher than in 2020.

Sewage disposal in 2021 increased by 22% and totaled 3,336.66 mln m^3.

As compared to 2020, water discharge to surface water bodies increased by 23.5% and amounted to 3,225.44 mln m^3.

Water discharge to sewage farms and absorption fields made 6.91 mln m^3, to holding basins – 0.57 mln m^3, to underground horizons – 23.24 mln m^3, of which 10.19 mln m^3 to maintain formation pressure. Discharge to public and other systems totaled 79.51 mln m^3.

Increase in water withdrawal in 2021 against 2020 was due to the growth in electricity generation at Gazprom energoholding. Taking into account that the majority of plants use through-flow service water systems, increase in water withdrawal provoked discharge rise.

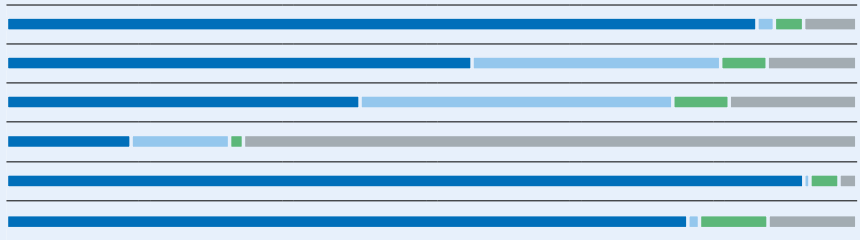
Water recycling systems used 11,851.75 mln m^3.

Water use rates at the Gazprom Group, 2017–2021, mln m^3

	2017	2018	2019	2020	2021
Total water intake	**4,523.45**	**4,280.21**	**3,921.41**	**3,236.63**	**3,898.24**
incl. water from natural sources	4,283.52	4,065.34	3,571.28	2,905.78	3,520.59
Used for own needs	**4,421.11**	**4,180.89**	**3,863.11**	**3,175.81**	**3,836.75**
incl. production needs	4,164.84	3,947.36	3,678.12	3,008.63	3,518.42
Water disposal to surface water bodies	**3,905.26**	**3,658.44**	**3,241.79**	**2,610.78**	**3,225.44**
incl. clean and treated as per standards	3,781.68	3,579.48	3,152.71	2,533.70	3,125.43

In 2017–2021, the Gazprom Group reduced:
- **water consumption for production needs by 16%**
- **water intake from natural sources by 18%.**

The Gazprom Group water consumption structure by source types, 2021, mln m^3 , %



	The Gazprom Group	Gas business companies	Including PJSC Gazprom	Gazprom Neft Group	Gazprom energoholding	Gazprom neftekhim Salavat
Surface sources	3,440.01	55.91	28.26	31.40	3,318.19	34.51
Underground sources	80.58	29.87	24.98	24.79	25.33	0.59
Domestic water supply facilities	133.97	5.58	4.51	3.50	121.42	3.47
Other water supply facilities	243.68	10.76	10.20	154.49	73.93	4.50

The share of natural sources at the Gazprom Group's water intake volume comprises 90%, of which 98% is accounted for surface water bodies, and 2% – for underground sources. The Gazprom Group's water consumption structure depends on specifics of operation activities and facilities location.

In 2017–2021, the Gazprom Group discharged 17% less wastewaters to surface water bodies. Clean without treatment and treated as per standards wastewaters accounted for 97% in the total volume of the Group's discharge.

Discharge to surface water bodies at the Gazprom Group, 2017–2021, mln m³

	2017	2018	2019	2020	2021
The Gazprom Group	**3,905.26**	**3,658.44**	**3,241.79**	**2,610.78**	**3,225.44**
Gas business companies	33.87	31.80	41.83	45.90	44.09
incl. PJSC Gazprom	10.74	9.78	18.89	23.08	21.43
Gazprom Neft Group	0.12	0.11	0.09	0.07	0.11
Gazprom energoholding	3,832.00	3,587.15	3,161.88	2,525.10	3,144.20
Gazprom neftekhim Salavat	39.26	39.38	37.99	39.71	37.04

Gazprom energoholding covers 91% of the total water consumption, and 97% of the total water discharge to surface water bodies of the Gazprom Group. The Gazprom Group's gas business share in overall water consumption volume is not very high, and amounts to 1.4%, including 0.7% by PJSC Gazprom.

In 2017–2021, the Gazprom Group reduced wastewater discharge to surface water bodies by 17%.

Discharge to surface water bodies at PJSC Gazprom by types of activities, 2017–2021, mln m³

	2017	2018	2019	2020	2021
PJSC Gazprom	**10.74**	**9.78**	**18.89**	**23.08**	**21.43**
Production	0.37	0.59	1.35	3.22	4.81
Transmission	6.73	5.53	5.47	5.20	5.33
Underground gas storage	0.14	0.14	0.11	0.10	0.11
Processing	0.10	0.24	0.23	0.24	0.23
Other activities	3.40	3.28	11.73	14.32	10.95

Decrease in wastewater discharge to surface water bodies by PJSC Gazprom companies is mainly associated with reduction in the washing of underground reservoirs during the Kaliningradskoye UGS construction.

Every year, the Gazprom Group conducts a large number of environmental campaigns aimed at improving of water use efficiency for production and household needs, and increasing the treatment level of discharged wastewaters. The Gazprom Group commissioned 82 wastewater treatment facilities with a total capacity of 64.44 thousand m³/day (40 facilities at Gazprom Neft, 5 – Gazprom energoholding, and 37 – gas business companies). From the total number of treatment facilities commissioned in 2021, 31 units with a capacity of 17.4 thousand m³/day were put into operation at PJSC Gazprom. Five circulation water systems with a capacity of 225.7 thousand m³/day were put into service.

In 2017–2021, the Moscow oil refinery of Gazprom Neft reduced water consumption by more than 13 mln m³ through "Biosphera" biological water treatment facilities. This system purifies industrial waters, rainwater runoffs and storm sewage with an efficiency of up to 99.9%, and allows for their repeated use in the production cycle. Gazprom Neft is at the final stage of "Biosphera" construction at the Omsk oil refinery. The facility is scheduled for commissioning at the latter half of 2022, and the Omsk OR will be able to switch to almost close-loop water consumption, and reduce water intake by 6 mln m³, annually.

Waste management

In 2021, the Gazprom Group companies generated 3,046.59 thousand tons of waste that is 6% lower as compared to 2020. This reduction is primarily due to completion of offsite facilities decommissioning at Gazprom Neft Group and reduction in waste generation.

Waste generation dynamics at the Gazprom Group, 2017–2021, thousand tons

2021	3,046.59
2020	3,229.83
2019	3,337.08
2018	3,555.09
2017	4,130.29

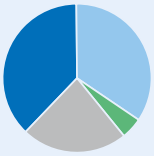
The majority of the Gazprom Group production waste (97%) is categorized as low hazardous and almost nonhazardous (hazard classes IV, V).

In 2017–2021, the Gazprom Group reduced waste generation by 26%.

The main volume of Gazprom Group waste is 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.

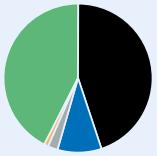
The Gazprom Group waste structure by types, 2021, %

Bottom ash waste	38
Drilling waste	34
Oil sludge	5
Other waste types	23



Share of the Gazprom Group companies in waste generation, 2021, %

Gazprom energoholding	43
Gazprom Neft Group	45
PJSC Gazprom	9
Other gas business companies	2
Gazprom neftekhim Salavat	1



Dynamics of waste generation at the Gazprom Group companies, 2017–2021, thousand tons

Gas business companies

2021	356.52	290.76
2020	337.48	272.24
2019	396.86	264.24
2018	430.81	285.90
2017	412.59	260.70

Gas business companies
Including PJSC Gazprom

Gazprom energoholding

2021	1,296.31
2020	1,287.80
2019	1,661.72
2018	1,998.40
2017	2,508.76

Gazprom Neft Group

2021	1,366.51
2020	1,550.89
2019	1,217.70
2018	1,007.25
2017	1,134.00

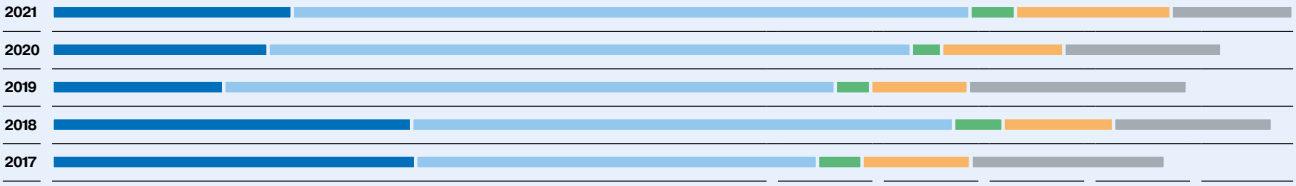
Gazprom neftekhim Salavat

2021	27.25
2020	53.66
2019	60.80
2018	118.64
2017	74.94

The year 2021 saw launching of six waste treatment and recovery units at Gazprom Neft Group's facilities with a total capacity of 10.5 thousand tons per year.

Gazprom implements effective management of production and consumption wastes, using thermal treatment facilities classified as the best available technique (BAT).

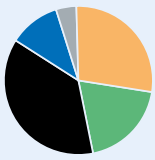
Waste generation dynamics by PJSC Gazprom's types of activities, 2017–2021, thousand tons



	2017	2018	2019	2020	2021
Production	85.18	84.27	39.97	50.26	56.27
Transmission	94.15	126.98	142.30	149.73	158.80
Underground gas storage	10.45	11.54	8.22	7.08	10.62
Processing	25.42	25.91	22.72	28.43	36.51
Other types of activities	45.50	37.20	51.03	36.74	28.56

As compared to 2020, the volume of waste generated by PJSC Gazprom in 2021 increased by 7% and totaled 290.76 thousand tons. This growth occurred almost in all business segments and was conditioned by expansion in the number of well constructions, repair works of the key assets, including equipment dismantling.

Structure of production and consumption waste management at PJSC Gazprom, 2021, %



Managed, recovered and treated at the company	19
Transferred to third-party organizations for management, recovery and treatment	37
Transferred to third-party organizations for storage and landfilling	11
Disposed at operated landfill sites	5
Waste remaining at the company by the end of the reporting year, including storage sites	28

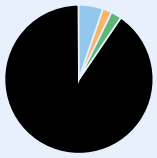
In 2021, 525.91 thousand tons of waste were managed by PJSC Gazprom subsidiaries (with the account of 130.41 thousand tons available at the beginning of the year, 290.76 thousand tons generated during the year, and 104.74 thousand tons that came from other companies).

Of that volume, 297.31 thousand tons were managed, recovered and treated by in-house capacities and transferred to third-party organizations for management, recovery and treatment, and 88.78 thousand tons were disposed at own sites and transferred to third-party organizations for safe disposal.

The Gazprom Group companies place high emphasis on environmentally secure management of oil-contaminated waste.

In the reporting year, the volume of oil-contaminated waste at the Group's facilities has decreased by 54%, as compared to 2020, and totaled 142.14 thousand tons, where 90% belongs to Gazprom Neft Group. This reduction is explained by completion of offsite facilities dismantling in 2020.

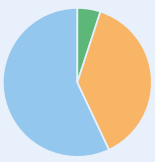
Share of the Gazprom Group companies in oil contaminated waste generation, 2021, %



Gazprom Neft Group	91
Gas business companies	5
Gazprom neftekhim Salavat	2
Gazprom energoholding	2

In 2021, 214.29 thousand tons of oil-contaminated waste were managed by the Gazprom Group (with account of 71.05 thousand tons available at the beginning of the year, 142.14 thousand tons generated during the year, and 1.09 thousand tons that came from other companies). Of that volume, 122.16 thousand tons were transferred to special organizations for recovery and treatment, and 10.74 thousand tons – for safe disposal.

Structure of oil-contaminated waste management at the Gazprom Group, 2021, %



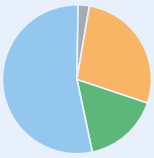
Transferred to third-party organizations for recovery and treatmen	57
Transferred to third-party organizations for disposal	5
Waste remaining at the company by the end of the reporting year, including storage sites	38

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

In 2021, 1,348.73 thousand tons of drilling cuttings were subject to waste management (with account of 294.21 thousand tons available at the beginning of the year, 1,054.52 thousand tons generated during the year). Of that volume, 223.15 thousand tons were recovered at the company, 32.75 thousand tons were disposed at own landfill sites, and 722.53 thousand tons were transferred to special licensed organizations for recovery and treatment.

Structure of drilling waste management at the Gazprom Group, 2021, %

Recovered at the Company	17
Transferred to third-party organizations for recovery and treatmen	54
Disposed at own landfill sites or storages	2
Waste remaining at the company by the end of the reporting year, including storage sites	27



One of the main requirements for process of well construction is the prevention of negative environmental impact of drilling waste, especially under severe natural and climatic conditions of the Arctic zone of the Russian Federation. Design solutions that can minimize impact on ecosystems in the process of drilling are being actively adopted. During well construction, green drilling mud formulae are being developed and used as well as pitless drilling. The practice of drilling waste recovery technologies to produce mineral construction materials for further use in field development is widely introduced.

To prevent negative impact on the environment, Sakhalin Energy allocates drilling wastes by pumping through special disposal wells into deep subsurface horizons with isolated beds. This provides total waste containment and safe disposal. This is one of waste disposal BATs for oil and gas production. Sakhalin Energy constantly monitors the pumping process and takes all reasonable measures to reduce drilling waste generation volumes. The company also monitors the state of the sea water in the bottom layer, bed deposits and benthos communities in the area of subsurface drilling waste disposal sites to confirm absence of the negative environmental impact.

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 reclamation of disturbed land. Technical and biological restoration 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.

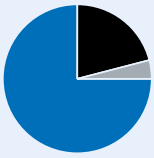
Indicators of land protection activities of the Gazprom Group, 2017–2021, ha

	2017	2018	2019	2020	2021
Disturbed lands within a year	42,162.29	25,786.97	22,885.37	23,837.88	19,809.45
incl. contaminated areas	87.33	111.26	73.16	79.41	65.79
Disturbed lands restored within a year	19,600.05	15,767.52	17,670.50	15,836.39	17,199.40
incl. contaminated areas	89.10	96.13	65.69	65.77	78.08

During the reporting year, the Gazprom Group companies disturbed 19.81 thousand ha of land, which is 17% lower than in the previous year, of which PJSC Gazprom is responsible for 14.86 thousand ha, Gazprom Neft Group – 4.15 thousand ha, and other Gazprom Group's companies – 0.8 thousand ha. Disturbed land area reduction in 2021 is mainly associated with declining seismic surveying activities at Gazprom Neft, and decrease in overhaul repair and construction at PJSC Gazprom's facilities.

Share of the Gazprom Group companies in disturbed land indices during the year, 2021, %

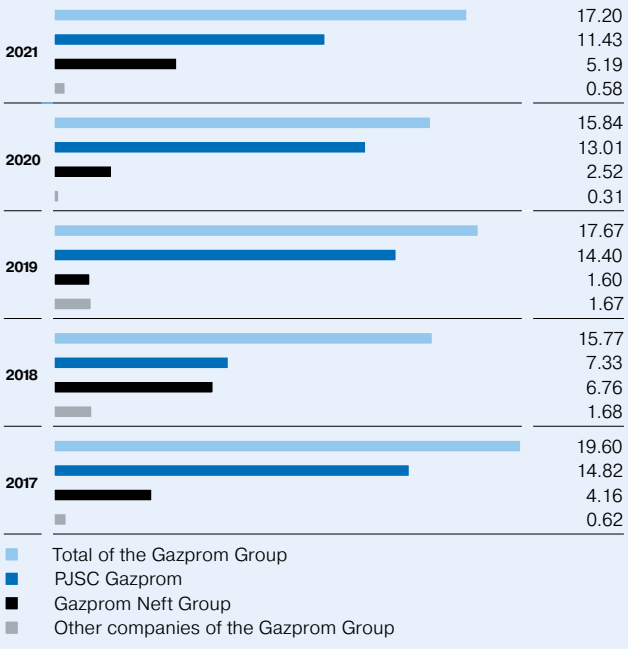
PJSC Gazprom	75
Gazprom Neft Group	21
Other companies of the Gazprom Group	4



Land resources are treated and restored by the Group to the extent required and on schedule. Lands, where works have been totally completed, and which were disturbed or contaminated during this and previous years, were restored. The reporting year saw restoration of 17.20 thousand ha of land, including 11.43 thousand ha restored by PJSC Gazprom, 5.19 thousand ha - by Gazprom Neft Group, and 0.58 thousand ha - by other Gazprom Group companies.

8.6% increase in the volume of lands restored in 2021 is due to the return of unused lands to the lease provider.

Dynamics of disturbed land restoration at the Gazprom Group companies, 2017–2021, thousand ha



Necessary land quality reclamation measures have been undertaken for 78.08 ha that was contaminated during the year.

Applied restoration methods are aimed at preventing negative erosion processes development, stabilizing landscapes and restoring soil and vegetation cover. Technologies use accessible materials, including secondary (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.

In 2021, OOO Gazprom invest on behalf of PJSC Gazprom performed forest reproduction works in nine constituent entities of the Russian Federation on a total area of 1,356.02 ha.

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

Prevention of accidents

Every year, the Gazprom Group companies take measures to prevent accidents to increase equipment reliability and mitigate accident risks at the operated facilities of the Gazprom Group. They comprise technical diagnostics of pipelines, injection of corrosion inhibitors, timely repair and maintenance works, flood and erosion protection measures, regular inspections of plugged and abandoned wells, regular inspections of LSs of GTLs and offshoot pipelines to detect cracks and gas leaks, including the use of laser radars; supplying of necessary equipment and hydrocarbon spill response tools.

In 2021, there were five environmental accidents at the Gazprom Group companies at production and GTL facilities: OOO Gazprom transgaz Ekaterinburg – two accidents, OOO Gazprom dobycha Nadym, OOO Gazprom transgaz Stavropol, OOO Gazprom transgaz Chaikovsky – one accident per each. Propagation of stress corrosion cracks and mechanical impact from excavation equipment were the main reason of accidents at the operated facilities.

Accidents culminated in 23.35 mln m^3 natural gas losses at the Gazprom Group that is equivalent to RUB 97.3 thousand in environmental damages.

The reporting year evidenced 765 ruptures of pipelines at the Gazprom Group. The volume of spilled oil and petroleum products amounted to 167 tons. The main contributors are Gazprom Neft Group (160 tons) and OOO Gazprom dobycha Orenburg (7 tons). Pipeline ruptures at Gazprom Neft Group occurred on the LSs of infield pipelines. Internal corrosion defects caused by transmission of corrosive media at oil and gas fields are the main reason for this ruptures.

Environmental accidents and ruptures of oil and condensate pipelines 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, power generation and trade in the Republic of Armenia. In 2017, ZAO Gazprom Armenia successfully introduced the EMS that complies with ISO 14001:2015 requirements. ZAO Gazprom Armenia is included in PJSC Gazprom EMS application scope.

In 2021, gross pollutant emissions totaled 56.01 thousand tons, i.e. 21% higher than last year. Increase in gross emissions is due to increase in natural gas coming to the Republic of Armenia. GHG emissions from gas business and power facilities decreased and amounted to 1.31 mln tons of CO_2e that is 20% lower than in 2020 thanks to no power generation by the Razdan-5 power unit in the reporting year.

Water discharge into surface water bodies in 2021 amounted to 20.53 thousand m^3. 100% of this volume are effluents treated to standard quality.

During the year, 0.11 thousand tons of waste were produced, 93% of which belongs to hazard class IV. Waste generation decrease by 116 tons is thanks to completion of the upgrading of the heating unit at the Razdan-5 CHPP and the replacement of pipeline fittings.

Environmental fee decrease by 68% in 2021 is a result of the absence of negative environmental impact from the Razdan-5 unit.

State environmental control bodies did not conduct inspections during the reporting year.

ZAO Gazprom Armenia basic environmental indicators, 2017–2021

Indicators	2017	2018	2019	2020	2021
Gross emissions, thousand tons	88.61	69.48	62.36	46.27	56.01
GHG emissions, mln tons CO_2e*	2.61	2.46	1.96	1.63	1.31
Water discharge into surface water bodies, thousand m^3	115.00	146.00	140.00	148.00	20.53
incl. clean and treated as per standards	115.00	146.00	140.00	148.00	20.53
Waste generated, thousand tons	0.12	0.12	0.12	0.22	0.11
Disturbed land by the end of the year, ha	0	0	0	0	0
Environmental fee, thousand RUB	592.42	1,109.56	953.74	1,104.30	357.46
Share of payments within established rates in the total payment amount, %	100	100	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 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 19.8 thousand tons that is 21% lower than in 2020 thanks to less gas compressor units (GCU) operation time and reduction in repair works on the LSs of GTLs.

Discharge of wastewaters into surface water bodies amounted to 131.03 thousand m^3. All effluents by 100% pertain to the categories of clean as per standards and treated to standard quality waters.

In 2021, OAO Gazprom transgaz Belarus generated 20.33 thousand tons of waste, 97% of which pertain to hazard class IV.

Environmental fee within the scope of set limits totaled RUB 12.9 mln, which is 26% less than in 2020. There were no limit-exceeding impacts.

OAO Gazprom transgaz Belarus basic environmental indicators, 2017–2021

Indicators	2017	2018	2019	2020	2021
Gross emissions, thousand tons	26.98	23.17	22.11	25.14	19.80
GHG emissions, mln tons CO_2e*	0.38	0.32	0.32	0.45	0.34
Water discharge into surface water bodies, thousand m^3	142.94	131.69	125.43	131.24	131.03
incl. clean and treated as per standards	142.94	131.69	125.43	131.24	131.03
Waste generated, thousand tons	5.96	4.92	5.61	12.34	20.33
Disturbed land by the end of the year, ha	0	0	0.87	0	0
Environmental fee, thousand RUB	24,608.43	22,664.04	21,315.97	17,401.03	12,902.86
Share of payments within established rates in the total payment amount, %	100	100	100	100	100

* GHG 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 2021, the regulatory bodies of the Republic of Belarus did not conduct inspections at OAO Gazprom transgaz Belarus facilities.

In December 2021, the Republican Unitary Enterprise Belorussian State Institute of Metrology as a certification body performed a compliance audit in OAO Gazprom transgaz Belarus. The audit confirmed OAO Gazprom transgaz Belarus's EMS conformance to the 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.

OsOO Gazprom Kyrgyzstan applies the EMS that complies with ISO 14001:2015 requirements. OsOO Gazprom Kyrgyzstan is included in PJSC Gazprom EMS application scope.

In 2021, gross pollutant emissions were 2.02 thousand tons, GHG emissions – 0.05 mln tons of CO_2e. 22% increase is due to cleaning of GTL inner surface.

The waste generation in 2021 amounted to 0.33 thousand tons, 88% of which pertain to hazard class V and solid household waste.

Environmental fee remained within set standards and totaled RUB 171.74 thousand.

In 2021, state environmental regulatory bodies of the Kyrgyz Republic did not conduct inspections at OsOO Gazprom Kyrgyzstan facilities, no penalties were imposed.

OsOO Gazprom Kyrgyzstan basic environmental indicators, 2017–2021

Indicators	2017	2018	2019	2020	2021
Gross emissions, thousand tons	1.49	3.82	2.93	1.66	2.02
GHG emissions, mln tons CO_2e*	0.04	0.09	0.07	0.04	0.05
Water discharge into surface water bodies, thousand m^3	0	0	0	0	0
incl. clean and treated as per standards	0	0	0	0	0
Waste generated, thousand tons	0.16	0.18	1.78	0.27	0.33
Disturbed land by the end of the year, ha	0	0	0	0	0
Environmental fee, thousand RUB	63.84	66.50	93.30	50.60	171.74
Share of payments within established rates in the total payment amount, %	100	100	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.

Non-CIS countries

The Gazprom Group companies fulfill foreign and international obligations. GHG emissions are monitored on a constant basis. In 2021, GHG emissions from subsidiaries and affiliates of OOO Gazprom export totaled:

- Astora GmbH – 21,513 tons of CO_2e
- WINGAS GmbH – 15,296 tons of CO_2e
- GAZPROM Germania GmbH – 92.9 tons of CO_2e
- Gazprom Marketing & Trading Ltd – 376.3 tons of CO_2e
- Gazprom Marketing & Trading Retail Ltd – 84.1 tons of CO_2e
- Gazprom Global LNG Ltd – 31.1 tons of CO_2e.

Gazprom EP International B.V. is a global operator of PJSC Gazprom's 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 technology and science innovations aimed at environmental impact mitigation.

In all regions of presence, the company aligns with environmental safety strategy that addresses all aspects of EP, including minimization of negative impact on ecosystems, resource saving and prevention of negative production factors impact on the health of the local population.

Basic principles of this strategy are as follows:

- carrying out engineering and environmental surveys within the scope of the works program to get information about the state of the regional ecosystem
- comprehensive planning of the project life cycle considering environmental safety and ecosystems rehabilitation upon works completion
- energy performance and fulfillment of environmental regulations of the applicable law taking into account requirements of all interested parties of the project
- sustainable development and technologies – constant investments into more safe and green exploration and production methods.

The company plans and takes EP measures on an annual basis, including:

- analysis of the legislation of the company's countries of operation, and compilation of environmental legislation registers applicable to the company's activities
- identification, registration and analysis of environmental aspects of the company's activities with ranking and development of measures to mitigate and/or eliminate negative impact on ecosystems considering the life cycle
- informing and training of personnel
- execution of scheduled events with results-checking by internal audits of the comprehensive management system and regular system's review by the company's management.

In 2021, Lloyds Register conducted supervision audit of Gazprom EP International B.V. for compliance with the ISO management system requirements. Auditors confirmed that Gazprom EP International B.V. meets requirements of ISO 14001:2015 Environmental Management System.

Preventing negative impact on the environment

Environmntal 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 the state expert review and environmental review.

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

Control over adherence to engineering decisions and EP requirements is performed by building inspection service. The implementation of designs is accompanied by the author's supervision.

In 2021, corporate environmental expert review examined 392 facilities under construction and upgarde.

Project documentation of the following large industrial facilities was reviewed:

- Development of the Kovyktinskoye gas condensate field. Construction stages 1-21, 22-31
- The Power of Siberia gas trunkline. Section Kovykta - Chayanda
- Expansion of the UGSS to increase supplies to Turkey
- Development of the Kamennomysskoye-more gas field. Stage 3. Ice-resistant platform A with utility lines to tie-in BCS
- Development of the Kamennomysskoye-more gas field. Stage 1. Gathering underwater utility lines
- System of Ukhta-Torzhok gas trunklines. III line (Yamal)
- Development of the Yuzhno-Kirinskoye field (Stages 1-21)
- UGSS reconstruction in the North-West Region to provide transmission of ethane-containing gas to the Baltic Sea coast
- Hookup of additional wells to existing capacities of the I and II phases of the Astrakhanskoye gas condensate field
- Upgrading of GTLs on Urengoy-Peregrebnoye-Ukhta route
- Development of the Vostochno-Kharvutinskaya site of the Yamburg OGCF
- Airport system at Levashovo airfield
- Reconstruction of the gathering system at the fields of the Nadym-Pur-Tazov region to supply ethane-containing gas to the area of the Novourengoyskaya GCS-1
- The Blue Stream – Russia – Turkey gas trunkline (offshore)
- Further development of the Cenomanian-Aptian deposits of the Bovanenkovo OGCF
- Sakhalin-Khabarovsk-Vladivostok gas trunkline
- Bovanenkovo-Ukhta gas trunkline. III line.

In 2021, state environmental review hearings were held with the help of remote communication tools to prevent the spread of a new coronavirus infection (COVID-19).

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 2021, 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 and its subsidiaries' 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 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 28.7 mln, including RUB 14.5 mln for damage of the previous years.

Operational environmental control and monitoring

Operational environmental control (OEC) of production facilities is organized in all the Gazprom Group companies and is aimed at fulfillment of EP legislation, compliance with specified environmental standards, rational use of natural resources and mitigation of environmental impact. At PJSC Gazprom's facilities, environmental control is implemented in alignment with a corporate standard STO Gazprom 12-2.1-024-2019 Regulatory Environmental Protection Documents. Gas Supply System. Operational Environmental Control. Basic Requirements.

Environmental control is a crucial system of measures intended to reduce negative impact on the environment and implemented at all stages of business activities of PJSC Gazprom subsidiaries, organizations and contractors.

PJSC Gazprom has a corporate Environmental Inspection Service that not only controls compliance of subsidiaries and contractors with requirements of EP legislation and corporate environmental and energy saving 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 2021, PJSC Gazprom Environmental Inspection Service conducted 441 environmental legislation compliance verifications. Due to COVID-19 limitations, some inspections and internal audits were carried out online in alignment with an authorized procedure.

PJSC Gazprom Environmental Inspection Service made 233 scheduled checks at 46 Gazprom's production subsidiaries and organizations, including 180 EMS audits. Specialists of PJSC Gazprom Environmental Inspection Service checked 10 natural gas producing companies, 19 gas transmission companies (among them OAO Gazprom transgaz Belarus, OOO Gazprom transgaz Grozny), 10 branch offices of OOO Gazprom UGS, 2 natural gas processing plants, 8 branch offices of OOO Gazprom energo, and 14 other subsidiaries (ZAO Gazprom Armenia, OsOO Gazprom Kyrgyzstan, OOO Gazprom nedra, OOO Gazprom neftekhim Salavat, Gazprom gazomotornoye toplivo, etc). The audit plan was 100% complete.

At facilities under construction and upgrading, 47 environmental and rational nature management legislation compliance verifications have been performed along with checking codes of practices of customers and contractors, such as OOO Gazprom invest, OOO Gazprom pererabotka Blagoveshchensk, OOO Gazprom burenie, AO Gazstroyprom, OOO GazEnergoServis, and others.

In 2021, PJSC Gazprom's Environmental Inspection Service participated in the technical audit of AO Gazpromneft-Aero (administration of the company, subsidiary OOO Gazpromneft-Aero Sheremetyevo).

158 validation checks related to environmental aspects identification have been performed according to a corporate standard STO Gazprom 12-1.1-026-2020 Environmental Management System. The Procedure for Identification of Environmental Aspects in 118 subsidiaries in charge for natural gas transmission and 25 – for gas production, 7 subsidiaries of OOO Gazprom UGS, 6 – OOO Gazprom pererabotka, 2 – OOO Gazprom energo.

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%.

Gazprom has developed and successfully operates the operational environmental monitoring (OEM) system that includes stationary and mobile eco-laboratories, 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 mitigate negative impact on the environment.

On a regular basis, the Company monitors methane emissions and carries out corporate control over gas leaks by the means of PJSC Gazprom's Environmental Inspection Service.

Round-the-clock monitoring systems for detection of methane in the atmosphere and auto alarm on its over-limits (remote laser methane detectors) are being introduced. Detectors installed on helicopters or unmanned aerial vehicles (UAV) are also used to identify methane leaks at gas industry facilities. The works on organization of advanced monitoring of GHG emissions, in particular methane, with the use of satellites are underway.

To ensure environmental safety, Gazprom with the help of Roskosmos[1] implements construction project on an assembly space vehicles plant. Alongside with the Yamal communication satellites, the plant will produce optical satellites for the SMOTR-V Earth remote sensing system. This will enhance opportunities for geotechnical monitoring and control of protective zones.

[1] The corresponding Cooperation Agreement was signed at the Saint-Petersburg International Economic Forum 2021 by Alexey Miller, Dmitry Rogozin, and Alexey Likhachev, General Director of Rosatom State Corporation.

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

Within the scope of the OEM, the Group's subsidiaries apply UAVs to detect and record violations of the environmental legislation. Photo and video data obtained during UAV visual inspections substantially enhance efficiency of monitoring, reduce time needed, and involvement of motor vehicles, which is of critical importance for difficult terrains. UAVs are equipped with thermal imaging cameras to detect thermal leaks from buildings, heating lines, and other facilities, fire areas in close vicinity to natural gas transmission facilities, which is of prime importance during the fire season.

Operational environmental monitoring widely uses mobile eco-laboratories (MEL) fitted with modern analytical equipment that controls atmospheric air, physical environmental factors, meteoparameters, and industrial atmospheric emissions from different sources. MELs have an UAV operator work station that provides an opportunity to work on open grounds with virtual reality glasses keeping indoors MEL. UAV has a high resolution camera and a thermal observation device that help to detect potential leak areas.

Construction of module laboratory facilities (MLF) fitted with advanced measurement tools, test and auxiliary equipment for instrumental environmental monitoring is one of the promising trends implemented by OOO Gazprom transgaz Yugorsk since 2008. Today, OOO Gazprom transgaz Yugorsk has 6 MLFs. These are quickly erectable structures with a steel frame located at the premises of compressor stations.

In 2021, a MLF fitted with advanced laboratory and analytical equipment was commissioned at the NovoUrengoysky LPD of GTL. It complies with all sanitary and epidemiological norms as well as laboratory room requirements. MLFs are quickly and easily assembled and equipped with all necessary utilities, supply and exhaust ventilation, which ensure safety of laboratory works.

Under the import substitution policy, laboratory equipment is only Russia-manufactured.

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

In 2021, automated gas contamination control stations (AGCCS) and MELs performed over 3 million measurements of pollutant concentrations in the air within the mining allotment of the Orenburg OGCF, including: hydrogen sulphide, hydrocarbons, sulphur dioxides, carbon oxides, nitrogen oxides, and methane. Monitoring is carried out on a 24-hour basis, and data are transmitted to the Center of Gas and Environmental Safety in real-time mode. Monitoring results help to regulate effectively workflows associated with peak emissions depending on meteorological conditions. Works will not be permitted, when the wind is blowing at adjacent populated areas.

Over ten years, there has been a constant dialog with the heads of municipality administrations and residents of the Orenburgsky and Perevolotsky districts of the Orenburg region located in the affected zone of the Orenburg gas producing complex upon the following issues:

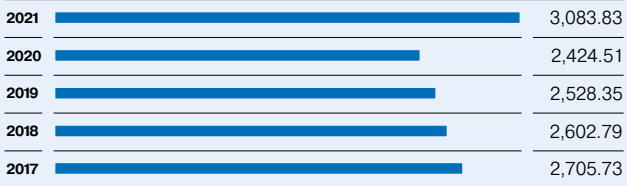
- reporting to the Ministry of Natural Resources, Ecology and Property Relations of the Orenburg Region, territorial authorities of the Federal Supervisory Natural Resources Management Service (Rosprirodnadzor), and heads of municipality administrations on planned preventive and maintenance works at OOO Gazprom dobycha Orenburg facilities
- sending information letters on concentrations of pollutants in the air according to AGCCS data to administrations of 24 populated areas, heads of the Orenburgsky and Perevolotsky districts of the Orenburg region on a monthly basis
- cooperating with heads of municipality administrations and authorized representatives of residents to immediate investigate claims and complaints on air pollution.

The year 2021 saw continued cooperation with the Western Gray Whale Advisory Panel (WGWAP) of the International Union for Conservation of Nature (IUCN) with a view to elaborate optimum decisions to mitigate impact on whales. Advisory Panel agenda included the meetings of Sakhalin Energy's representatives with member-scientists of the Panel, state regulators, and nongovernmental environmental organizations, which are the part of the Panel with observation rights. A set of measures it taken to protect endangered species and ensure safe execution of works, including developing corridors, ship speed restrictions, determination of safe distances to marine mammals, and compulsory observers onboard to mitigate collision risks.

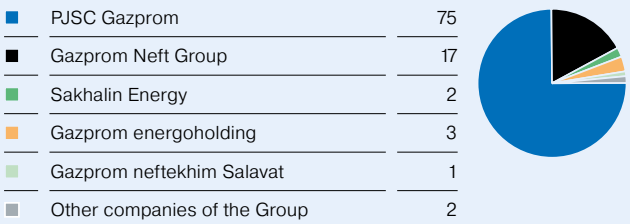
If specially protected natural areas (SPNAs) or special environmental status sites are located in the affected by business activities areas, the Gazprom Group is obliged to include monitoring over their state into OEM programs.

In 2017–2021, the Gazprom Group invested RUB 13.3 bln into operational environmental monitoring and control.

The Gazprom Group expenditures on operational environmental monitoring and control, 2017–2021, mln RUB



Structure of operational environmental monitoring and control expenditures at the Gazprom Group, 2021, %



State environmental supervision

In 2021, state supervisory bodies conducted 949 environmental compliance verifications for the Gazprom Group facilities, which resulted in 1,119 violations revealed as well as 641 verifications with no violations.

Out of 1,119 revealed violations, 92 violations (8%) have been cancelled through legal proceedings, 134 violations (12%) are appealed through the courts against, 534 violations (48%) have been corrected at a given time, correction deadline for 225 violations has not expired in 2021. The year saw correction of 673 violations, including 139 remedied upon the results of inspections of previous years.

From the total number of identified violations, 686 (61%) did not carry penalties for legal entities.

Penalties paid in the reporting year totaled RUB 23.86 mln, including RUB 5.79 mln as a result of previous years inspections. Penalty payments were as follows: Gazprom Neft Group – RUB 13.59 mln; PJSC Gazprom – RUB 8.21 mln; Gazprom energoholding – RUB 0.79 mln; AO Gazprom dobycha Tomsk – RUB 0.68 mln; OAO Severneftegazprom – RUB 0.43 mln; OOO Gazprom neftekhim Salavat – RUB 0.09 mln; OOO Gazprom mezhregiongaz – RUB 0.07 mln.

In 2021, compensation payments for damage to the environment by the Gazprom Group amounted to RUB 262.31 mln (incl. PJSC Gazprom – RUB 18.59 mln), including RUB 252.52 mln paid for damage incurred in previous reporting periods (incl. PJSC Gazprom – RUB 15.02 mln).

Improving energy efficiency and energy saving

The role of energy saving in implementation of sustainable development principles and achievement of environmental goals

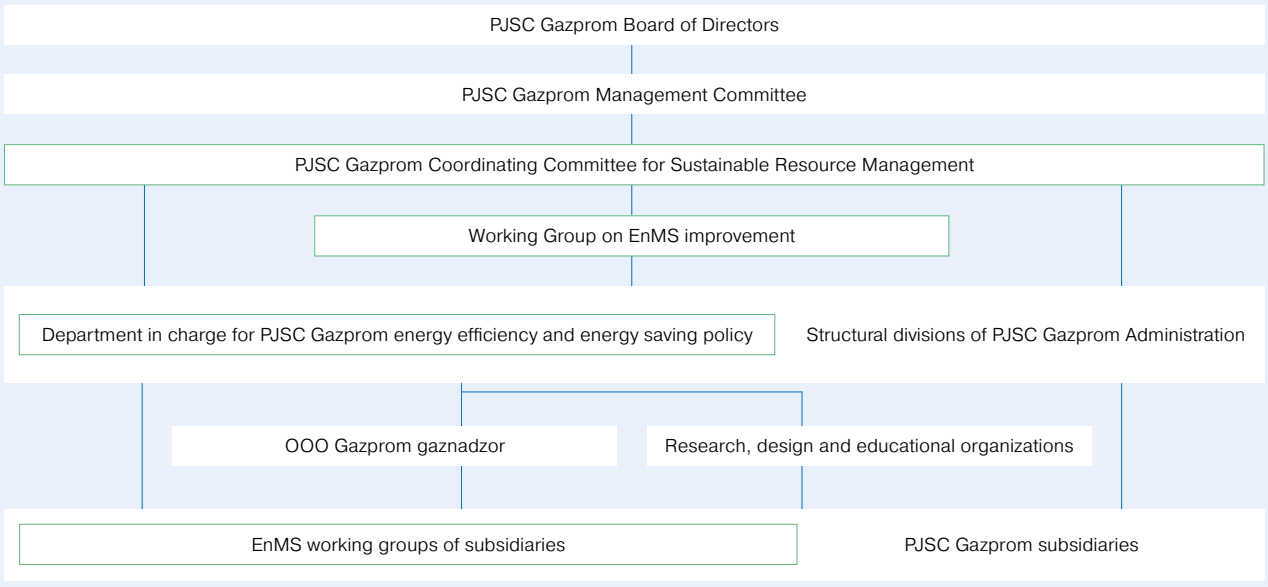
Energy efficiency improvement is one of the top priority tasks that fosters PJSC Gazprom's technological development, restricts threat of negative impacts related to climate change, and consolidates economic performance. Energy efficiency management system is based on the federal legislation requirements, nature conservation principles, the Company's liabilities as envisaged by PJSC Gazprom's Energy Efficiency and Energy Saving Policy approved by the Company's Management Committee Decree No.39 as of 11 October 2018, international agreements and liabilities to investors.

Energy efficiency and energy saving management

PJSC Gazprom's Energy Management System (EnMS) meets ISO 50001:2018 requirements, which was acknowledged in the course of the surveillance audit 2021 performed by the international auditor company Bureau Veritas Certification Russia. EnMS is integrated into the Company's existing development practices. It maintains logics and principles of continuous improvement, promotes communication on sustainable resource management at different executive levels, and thus unlocks energy saving potential at subsidiaries in a more substantive manner. Prioritizing in introduction of newenergy saving practices and technologies establishes energy performance indicators, which provides a basis for developing of the activities of the Energy Saving Program and Promising Area in R&D.

The Company's EnMS includes 26 subsidiaries and structure divisions of PJSC Gazprom Administration pursuant to the approved certification scope. PJSC Gazprom EnMS structure incorporates every single Company's level responsible for decision-making directly or indirectly influencing the rate of energy resources consumption. PJSC Gazprom EnMS structure is provided in the figure below.

PJSC Gazprom energy management system organization chart



Energy efficiency and energy saving corporate goals

The following energy efficiency and energy saving corporate goals for 2021 were developed and approved within PJSC Gazprom's EnMS as consistent with the Company's Energy Efficiency and Energy Saving Policy:

- improving energy efficiency of PJSC Gazprom's activities
- saving fuel and energy resources (FER) in operation activities related to production, transmission, underground storage, processing and distribution of natural gas
- developing, introducing, preparing to certification, maintenance and improvement of PJSC Gazprom's EnMS in compliance with ISO 50001:2018.

Energy efficiency indicators to assess achievement of the set goals are as follows:

- reduction in specific consumption of fuel and energy – resources during operation activities – at least 1.2%
- natural gas saving – 3,741.32 mln m^3
- electrical power saving – 374.78 mln kWh
- heat power saving – 176.53 Gcal
- conformity assessment within PJSC Gazprom EnMS scope and boundaries (international certificate) – Certificate was conformed.

Achievement of corporate goals and indicators is done under triennial Energy Saving Programs for the following business activities: production, transmission, underground storage, processing, distribution of natural gas, power and water supply, operation of the power equipment of the Unified Gas Supply System (UGSS).

Energy efficiency

In 2021, the cumulative energy resources consumption for PJSC Gazprom's own process needs totaled 66.15 mln tons c.e. due to the growth of main operating parameters (+12% of gas transmitted, +7% of gas produced).

Natural gas and electric power specific consumption for own process needs (comparable activities) was specified in the Program and as of year-end amounted to 28.34 kg c.e./mln m^3 • km.

Saving of fuel and energy resources

Upon accomplishment of activities stipulated by the Program, total FER savings for own process needs amounted to 4,799.1 thousand tons of c.e. (RUB 17,976.9 mln), including:

- natural gas – 4,008.97 mln m^3 (RUB 15,809 mln)
- electrical power – 377.81 mln kWh (RUB 1,570 mln)
- heat power – 185.75 thousand Gcal (RUB 179.84 mln)
- motor fuel, combustibles and lubricants (C&L) – 16.96 thousand tons c.e (RUB 417.49 mln).

Outcomes of PJSC Gazprom Energy Saving and Energy Efficiency Improvement Program, 2021

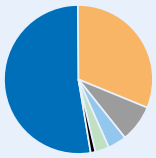
Type of activity	Natural gas, mln m^3	Electrical power, mln kWh	Heat power, thousand Gcal	C&L and motor fuel, thousand tons of c.e.	Total, thousand tons of c.e.	Total, mln RUB
Gas, condensate and oil production	428.7	32.2	11.6	0.0	507.6	1,411.3
Trunkline gas transmission	3,488.9	312.4	43.7	16.6	4,154.9	15,902.8
Underground gas storage	15.4	5.6	0.0	0.0	19.7	103.9
Gas and liquid hydrocarbons processing	43.9	10.3	129.3	0.0	73.5	289.5
Gas distribution	31.2	6.0	0.7	0.4	38.6	210.1
Energy & water supply	0.8	11.3	0.5	0.0	4.8	59.3
Total	**4,008.9**	**377.8**	**185.8**	**17.0**	**4,799.1**	**17,976.9**

Trunkline gas transmission is a leader in FER saving (72.3%) followed by gas, condensate and oil production (8.1%), and other types of activities (approx. 19.6%).

In all the Company's business activities, natural gas constitutes approximately 92% of the total FER consumption. This circumstance unlocks considerable opportunities for application of innovative solutions and technologies to save energy resources.

Natural gas saving breakdown in trunkline gas transmission, 2021, %

Repair works and process operations at gas pipelines and equipment	52.5
Optimization of GTS process facilities operation modes, enhancing hydraulic performance of gas pipelines	31.6
GCU replacement, re-equipment, and upgrade	8.3
Operation modes optimization of gas equipment and gas burner units	3.8
GPU maintenance	3.5
Other	0.3



The major contribution into natural gas saving (approx. 93%) is made by the activities aimed at:
- reducing gas volumes during repair works and process operations at gas pipelines and equipment – 52.5%
- optimization of GTS process facilities' operation modes, enhancing hydraulic performance of gas pipelines – 31.6%
- GCU replacement, repair, re-equipment, and upgrade – 8.3%.

Natural gas saving at UGSS facilities, 2018–2021, bcm

2021	1.91
2020	1.74
2019	1.54
2018	1.30

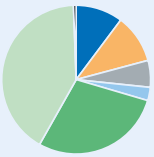
Adoption of a MCS is one of the most successful projects to prevent blowing of natural gas during repair works at gas trunklines. In 2021, this technology became widely used at all gas transmission subsidiaries, and helped to achieve targeted values. In 2020-2021, MCS utilization saved over 1 bcm of gas. The reporting year saw additional saving of 744.7 mln m^3 (targeted 2021 value was set at 700 mln m^3).

Natural gas saved thanks to MCS utilization, 2018–2021, mln m^3

2021	744.7
2020	486.0
2019	60.5
2018	36.1

Natural gas saving breakdown in production, 2021, %

GCU replacement, re-equipment, and repair	10.2
GCU maintenance	10.6
Operation modes optimization of facilities at gas fields	5.8
Repair, performance and commissioning works (boiler houses, gas heaters)	2.9
Operation modes optimization of gas equipment and gas burner units	28.7
Reduction in gas losses during repair works and process operations in wells and pipelines	41.2
Adoption of automatic control systems, telemechanics, improving gas metering devices	0.6



The major contribution (approx. 90%) in natural gas saving during production is made by the activities aimed at:
- reduction in gas losses during repair works and process operations in wells and pipelines – 41.2%
- operation modes optimization of gas equipment and gas burner units – 28.7%
- GCU maintenance – 10.6%
- GCU replacement, re-equipment, and repair – 10.2%.

In 2021, implemented series of actions altogether prevented at PJSC Gazprom blowing of over 1.91 bcm of natural gas that is 20% higher as compared to the previous year (31.39 mln tons of CO_2e).

The main contributor in the savings is gas trunkline transmission. In 2021, during the repair works of trunklines, the venting of more than 1.71 bcm of natural gas (28.10 mln tons of CO_2e) was prevented, including over 744 mln m^3 of natural gas (12.23 mln tons of CO_2e) thanks to MCS utilization.

Pilot energy saving projects

PJSC Gazprom makes proactive efforts to extend its practices of attracting investments on the basis of energy service contracts to accelerate adoption rates of new energy saving technologies and reduce loads on the investment program. Currently, energy service contract mechanisms are used in such large-scale projects as:

– construction of the turbo expander power system at the Dobryanka-2 GDS
– replacement of changeable flow channels in centrifugal compressors
– replacement of the current lighting by energy effective one.

Cumulative investments into these most demanded projects exceed RUB 6 bln, and the Group's economic potential will achieve almost RUB 27.5 bln during equipment life cycle.

R&D in energy saving and energy efficiency improvement

Development of new technologies and process solutions, and their further adoption at UGSS facilities under the corporate R&D program facilitates improvement of the workflows energy efficiency.

Ejection technology to conserve gas in case of CS operation mode changes. OOO Gazprom transgaz Kazan has a prototype ejector to pump gas from process the equipment of the Arskaya CS. The volume of gas saved during tests was approximately 72% of the gas blown during the GCU shutdown. In February 2021, the Shemordanskoye LPD of GTL (OOO Gazprom transgaz Kazan) performed acceptance tests of the two-stage jet ejector installed in the system that pumps out gas from the compressor room (CR) equipment. This technology will help to conserve up to 360 thousand cubic meters of natural gas from the Arskaya CS's compressor rooms under shutdown for repair.

R&D deliverables will be used in the development of the program on CS ejector technology adaptation. This program will generalize the corresponding experience of subsidiaries and define target adoption facilities. Gas blowing reduction prospects thanks to this technology are estimated at:

– 34 mln m^3/year when discharging the injection profile in case of the GCU shutdown
– 59 mln m^3/year when blowing gas from the gas line hook-up of the CR.

Technologies of air cooling at GTU (gas turbine unit) inlet. The Kotelnikovskaya CS (OOO Gazprom transgaz Volgograd) adopts the technology to compensate decrease in GTU available capacity in summer by cooling cycle air delivered to GTU and based on utilization of the absorption lithium bromide refrigerating machine.

This project is implemented for the first time for gas transmission.

Technology of air cooling at GTU inlet down to 10°C will increase the available capacity of the GTU of GCU up to 25% in summer, and decrease consumption of CR fuel gas to 8% per month depending on the ambient temperature.

The technology will be implemented stepwise:

– 2022 – installing and testing air cooling system prototype
– 2023 – carrying out trial operation of the system in real-life environment.

Heating technology for fuel and start-up gas at CRs using aggregate lube oil-gas modules and lube oil-gas heat exchangers. This technology heats fuel gas by recuperation of the heat power (subject to recovery) of the lubricant oil of gas turbine and GCU compressor, and thus reduces electrical power consumption for oil cooling.

Lube oil-gas heat exchangers use sophisticated engineering designs with advanced calculation methods to reduce FER consumption at CRs:

– reduction in natural gas consumption for fuel gas heating – 100%
– reduction in electric power consumption for oil air coolers – up to 80%
– metal saving due to reduction in piping volume – up to 11.5%.

This R&D resulted in the development of the Program on Adoption of the Fuel and Start-up Gas Heating Technology in Compressor Rooms using Aggregate Lube Oil-Gas Modules and Lube Oil-Gas Heat Exchangers. The Program's goal is to reduce power consumption at PJSC Gazprom's CRs of gas trunkline transmission. FER saving prospects are estimated at:

– 57.8 mln m^3 of natural gas
– 39.4 mln kWh of electrical power.

Internal EnMS audit

Subsequent to the results of PJSC Gazprom EnMS surveillance audit 2021, further improvement of PJSC Gazprom's EnMS is underway.

In 2021, 9 subsidiaries underwent internal audits for compliance with ISO 50001:2018 within PJSC Gazprom EnMS scope and in accordance with PJSC Gazprom EnMS Internal Audit Program: OOO Gazprom dobycha Krasnodar, OOO Gazprom transgaz Kazan, OOO Gazprom transgaz Nizhniy Novgorod, OOO Gazprom transgaz Samara, OOO Gazprom transgaz Ekaterinburg, OAO Gazprom transgaz Belarus, OOO Gazprom dobycha Orenburg, OOO Gazprom dobycha Nadym, OOO Gazprom pererabotka. No significant unconformities were revealed.

Based on the findings of the performed internal audits it was concluded to proceed with further PJSC Gazprom's EnMS improvement.

Training in the EnMS

The core drivers in achievement of the Company's sustainable development goals and successful adoption of its policy in energy efficiency and energy saving are personnel skills and experience required for effective performance.

In 2021, heads and specialists of subsidiaries advanced their professional competences under PJSC Gazprom's corporate continuous professional training system in accordance with the Target Training Program of PJSC Gazprom and individual plans. Over 790 employees of PJSC Gazprom and its subsidiaries participated in designated EnMS workshops and training courses that were organized and held in the reporting year for the leading EnMS auditors and specialists of subsidiaries' divisions.

Public energy saving activities

Every year PJSC Gazprom's subsidiaries take active part in different public events focused on promotion of energy saving and efficiency principles.

In 2021, subsidiaries participated in the All-Russian Energy Saving and Ecology Festival #VmesteYarche held under the auspices of the Ministry of Energy, the Ministry of Natural Resources and Environment, the Ministry of Science and Higher Education of the Russian Federation, federal, regional, and municipal organizations as well as public youth groups.

Under the aegis of the Vernadsky Non-Governmental Environmental Foundation, subsidiaries also took part in the All-Russian Environmental Campaign called Green Spring in all regions of Company's presence.

Simple tasks, open lessons and public activities demonstrate how we can reduce environmental footprint and preserve the environment. They address such topics as careful attitude to the mineral resources wealth, energy efficient technologies used by the Company, rational water consumption, use of alternative fuel, battery recycling, and conservation of energy in everyday life.

PJSC Gazprom Neft

PJSC Gazprom Neft energy management system complies with ISO 50001:2018 requirements and is integrated into the corporate management system. In 2021, subsidiaries underwent ISO 50001:2018 conformity certification audits. The year also saw full-fledged launching of the digital project on information and analytical system Energy Efficiency of the Exploration and Production Modules. This project falls under the Digital Energy Program.

The company runs energy saving and energy efficiency program designed to improve energy efficiency ratio and reduce energy losses thanks to scheduled annual activities through the main business segments. In the reporting year, energy saving program conserved 3.66 mln GJ.

Logistics, processing, and marketing module saved 2.92 mln GJ of energy resources, whereas exploration and production module conserved 0.74 mln GJ in 2021.

Gazprom energoholding

OOO Gazprom energoholding is the largest Russian owner of electrical power assets (generation of electrical and heat energy). Gazprom energoholding owns 79 power plants with installed capacity of approx. 36.4 GW (electricity) and 77.2 thousand Gcal/hour (heat), which is approximately 17% of installed capacity of the Russian electrical power industry. The top priority goal for Gazprom energoholding is to set up energy saving technologies, develop and apply technologies based on the principles of the rational use of energy resources. Energy saving and energy efficiency improvement programs are underway at all Gazprom energoholding companies. They pull efforts on the route towards key sustainable development goals.

In 2021, cumulative energy consumption for own needs at Gazprom energoholding totaled 2.59 mln tons c.e., including 0.02 mln tons c.e. at the Svobodnenskaya combined heat and power plant (CHPP). Volume of energy consumption from RES amounted to 5 thousand tons c.e.

Changes in specific fuel equivalent consumption resulted in energy saving due to increase in the share of combined heat and power generation and optimization of the equipment set. Activities specified in the Energy Saving Programs are aimed at FER consumption decrease, namely fuel, electrical power, heat, and water.

Cumulative energy consumption reduction thanks to direct energy saving initiatives implemented at Gazprom energoholding in 2019–2021 surpassed 54 mln GJ.

In 2021, Gazprom energoholding energy saving and energy efficiency improvement programs ensured energy resources saving amounting to RUB 4,288 mln.

Performance indicators of energy saving and energy efficiency improvement programs at Gazprom energoholding, 2021

	Fuel saving			
	Total	Including natural gas	Electrical power saving	Heat power saving
Total	807.3 thousand tons c.e.	805.0 thousand tons c.e.	34.2 mln kWh	70.3 thousand Gcal
Total, mln GJ	23.7	23.6	0.1	0.3

Gazprom neftekhim Salavat

OOO Gazprom neftekhim Salavat is one of the leading petrochemical complexes in Russia. The entity performs a full hydrocarbon feedstock processing cycle and produces over 100 items with 50% share of large tonnage products, such as motor gasolines, diesel fuel, oil residue, construction bitumen, polystyrene, high pressure polyethylene, ammonium, carbamide, etc.

In 2021, cumulative energy consumed by OOO Gazprom neftekhim Salavat totaled 83.15 mln GJ. Main energy resources of the company are heat (39.26 mln GJ), natural gas (30.53 mln GJ), and electricity (13.36 mln GJ).

Results of energy saving and energy efficiency improvement programs implemented at OOO Gazprom neftekhim Salavat, 2018–2021

Parameter	2018	2019	2020	2021
Natural gas saved, mln m^3	43.783	43.511	0.000[2]	0.000[2]
Electrical power saved, mln kWh	0.883	1.311	1.611	0.403
Heat power saved, thousand Gcal	49.675	35.559	31.675	33.078
Total, thousand tons c.e.	57.960	55.766	5.053	4.861
Total, mln GJ	1.699	1.634	0.148	0.142

[2] Natural gas saving activities are at the completion stage, which is scheduled for 2023.

Role of natural gas in low-carbon development

Natural gas significantly contributes into low-carbon development of the global economy.

Environmental impact of gas infrastructure expansion

Natural gas is the most effective source of available and reliable energy in ensuring sustainable development of the Russian Federation up to 2030.

Expansion and upgrade of the gas supply and infrastructure system in the regions of the Russian Federation is a grand-scale and socially minded focus area of PJSC Gazprom on the domestic market. This work fosters social and economic development of the Russian regions, and improvement of the living standards for citizens.

PJSC Gazprom manages regional gas supply and gas infrastructure expansion (henceforth – gasification) through five-year programs. 68 constituent entities of the Russian Federation are covered by the Program for 2021-2025, which envisages construction of over 24 thousand km of gas pipelines (2.5 times increase against previous five years), and creates conditions for gasification of 3.6 thousand populated areas (2.7 times increase).

Target values of the Russian Gas Infrastructure Expansion Program for 2021-2025

68 regions	gasification program participants
>24 thousand km	new gas pipelines
>3 thousand	boiler rooms and industrial facilities supplied with gas
> RUB 526 bln	investments
>538 thousand	houses and flats provided with gas service

As of 2021 year-end, gasification level of the Russian regions totaled 72%. The number of new points supplied with gas services notably increased – 43 mln flats and houses in 48 thousand settlements. Gasification target is 83% by 2030. Prospects of connecting to gas supply in Russia amounts to approximately 2.5 mln households. The beginning of 2021 received 566 thousand gasification requests. This is 4 times higher, than during the previous years[3]. PJSC Gazprom's subsidiaries implement the Gas Supply Development and Gas Infrastructure Expansion Program for 2021-2025 countrywide.

OOO Gazprom dobycha shelf Yuzhno-Sakhalinsk started construction of the gas pipeline with the Yuzhnaya GDS, Dolinsk GDS, and Korsakov GDS to enforce achievement of carbon neutrality goals in compliance with the Federal Law "Experiment on specific regulation of emissions and sinks of greenhouse gases in the Sakhalin region". The company is going to construct approximately 600 km of gas pipelines that will deliver gas to 64 settlements.

The gasification of regions in 2021 reduced greenhouse gas emissions by 1.078 mln tons of CO_2e.

In 2021, around 50% of total electrical power in Russia was generated by natural gas-fired CHPP.

Natural gas has the lowest carbon intensity as opposed to other fossil fuels, and can largely contribute into energy transition. Natural gas share increase in the energy balance of the Russian Federation impacts carbon intensity decline of the whole fuel and energy complex (FEC). According to data of the Analytical Center under the Government of the Russian Federation, the Russian FEC demonstrates one of the lowest carbon intensity among the largest global economies.

The gasification of regions promotes development of the gas motor fuel (GMF) market and mitigation of the negative climate impact of the transport sector.

Switching transport sector to natural gas

PJSC Gazprom continues its comprehensive efforts in extending the natural gas application scope on transport. This is a rational solution to the problem of pollutants and GHG emissions reduction for the boosting transport sector.

Gazprom's subsidiaries practice the use of GMF for its own fleet on a wide scale. In the future, natural gas as a motor fuel will extend its boundaries to road building applications.

By the end of 2021 and upon the results of Gazprom's Program on Expansion of Natural Gas Use as a Motor Fuel at the Subsidiaries' Fleet, the number of the Gazprom's Group natural gas vehicles (NGV) totaled 13,279 units, 712 NGVs were purchased. In 2022, 930 NGVs will be in operation. OOO Gazprom UGS opened special sites for mobile gas filling stations (MGFS) in the Orenburg, Saratov, and Moscow regions. Passenger buses and special-purpose motor vehicles will become the key consumers of MGFSs. Availability of such stations compensates remoteness of permanent NGV filling stations from some

[3] https://neftegaz.ru/news/gazoraspredelenie/720482-a-novak-uroven-gazifikatsii-rossii-po-itogam-2021-g-sostavil-72/

OOO Gazprom UGS branches and reduces the filling time significantly.

PJSC Gazprom extensively develops gas filling infrastructure. Russia has over 584 gas filling facilities, approx. 300 of which are managed by OOO Gazprom gazomotornoye toplivo. The Gazprom Group owns 386 permanent gas filling facilities, including those commissioned in 2021 – 35 facilities of OOO Gazprom gazomotornoye toplivo and 4 of PJSC Gazprom's subsidiaries.

The year 2022 will see commissioning of 40 new facilities in 19 constituent entities of the Russian Federation. The fleet of methane-powered vehicles is constantly growing, and specifically due to the Company's marketing programs, during which over 40 thousand of vehicles were re-equipped.

Expansion of GMF use is of strategic importance for economic and ecological development of the Russian regions, improvement of economic and environmental efficiency of transport, attraction of investments and federal funds, renewal of the passenger fleet, control of public transport fares, upturn of the transport companies in charge for public and freight traffic.

In 2021, GMF (or compressed natural gas, CNG) turnover and shipment from the Gazprom Group companies (including OOO Gazprom gazomotornoye toplivo) on the territory of the Russian Federation totaled 947.64 mln m^3. The year 2022 envisages increase in the CNG shipment volume up to 1.1 bcm.

Facilities of OOO Gazprom gazomotornoye toplivo located in the Krasnodar Territory, the Republic of Tatarstan and the Sverdlovskaya region hold the largest GMF turnover volumes. The Krasnodar Territory saw 11% increase in sales of GMF during nine months as compared to the same period in 2020, the Republic of Tatarstan – 15% increase, and the Sverdlovskaya region – 10%.

Currently, PJSC Gazprom in collaboration with authorities of constituent entities of the Russian Federation performs a set of pilot projects on accelerated development of gas filling network. Saint-Petersburg, the Republic of Tatarstan, the Rostov and Samara regions are among the front-runners in commissioning of new gas filling infrastructure. Saint-Petersburg conducts the 2021–2023 Concurrent Action Plan for the implementation of the Gas Motor Fuel Market Development project. The city is included into five pilot regions on GMF market development. In 2021, it sold over 25 mln m^3 of GMF.

The Kemerovskaya region implements the Mobile Natural Gas of Siberia project that creates conditions for natural gas use as a motor fuel on the territories of Kuzbass not covered by gas infrastructure expansion. The largest public transport company of the Prokopyevsk town organized mobile filling station able to refuel 45 buses with natural gas. The project also provides refueling of dump trucks that carry coal from the Kyjzasskiy mine.

Before the end of 2023, OOO Gazprom gazomotornoye toplivo is going to set up 285 gas filling facilities, including 55 gas filling stations located on the main federal highways. Their construction is accomplished under the scope of the Gazprom Group CNG/LNG Production and Filling Infrastructure Development Program for the Federal Highways.

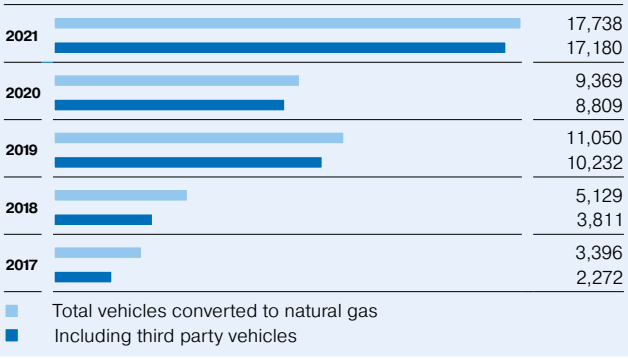
A basic NGV refueling network with 1,200 stations is in plans by 2024. According to the estimations of the National Gas Motor Association, the basic NGV refueling network will provide required conditions for further progressive increase in GMF demand.

PJSC Gazprom systematically develops the course towards using liquefied natural gas (LNG) as a motor fuel at cryogenic filling stations (cryo-FS) and servicing terminals. Gazprom executes projects on construction of LNG production facilities to provide switch powers and main-line locomotives with gas motor fuel on railroad sections in the Tyumen region, Khanty-Mansijsk and Yamalo-Nenets Autonomous Districts under the quadripartite cooperation agreement between PJSC Gazprom, JSC Russian Railways, JSC Group Sinara, CJSC Transmashholding on natural gas use as a motor fuel as well as cooperation agreement between OOO Gazprom gazomotornoye toplivo, OOO Gazprom LNG technologies, and OOO Gazpromtrans on using natural gas as a motor fuel at facilities.

Allocation of a natural gas liquefaction facility (NGLF) at a GDS with a high input and output pressure differential in a medium pressure cycle using turbo expanding assemblies is a promising action. Advantages of this technology comprise low operating expenditures of NGLF, minimum power consumption by the main process unit, and power independence due to power generation for own needs.

The Configuration Master Plan for gas motor fuel production and distribution infrastructure on the basic network of the existing and future federal public highways envisages concurrent construction of NGLFs and cryo-FSs. They will be used to fill public transport and freight vehicles on the most used federal roads of the state-owned companies Avtodor and Rosavtodor (M-10, M-11, M-4, etc.), and prospective routes Europe-West China and Eurasia.

Dynamics of the conversion of vehicles to natural gas at the Gazprom Group, 2017–2021, units/year



GMF can become an effective alternative to heavy diesel or marine fuel. The Gazprom Group takes proactive measures to develop LNG bunkering market. In 2021, OOO Gazpromneft Marine Bunker put into service the first in Russia marine LNG carrier bunker barge «Dmitry Mendeleev» that will provide bunkering (filling) of LNG vessels and low-tonnage LNG supplies in the Baltic sea. The year 2022 will see commissioning of the LNG low-tonnage production facility in the area of the Portovaya CS. This facility will focus on

bunkering of vessels in the Baltic region. The Gazprom Group also undertakes activities on the European GMF market via its subsidiary – Gazprom NGV Europe GmbH, and NIS a.d., which is part of Gazprom Neft Group.

In 2021, switching transport to natural gas prevented GHG emissions into the atmosphere in the amount of 410 thousand tons of CO_2e.

Tense epidemiological situation in 2021 restricted the Blue Corridor – Gas into Engines Rally to the territory of Russia: NGVs convoy mapped a route from Miass (the Chelyabinsk region) to Saint-Petersburg. The public and authorities were discussing technologies development, expansion of gas use as a motor fuel in different sectors of the economy, support measures for gas-powered equipment producers and consumers, and development of the related infrastructure, including Europe-China transport corridor.

Hydrogen economy

Natural gas provides a basis for creation of a new industry – the hydrogen economy. Experts acknowledged that producing hydrogen out of natural gas is the most prospective and economically feasible method.

To stimulate development of the technology intensive focus area Expansion of the Hydrogen Economy, Industry and Transport Decarbonisation on the basis of Natural Gas, the Government of the Russian Federation and PJSC Gazprom signed an Agreement of intent on the 13th of October 2021 during the Russian Energy Week.

The goals pursued by this Agreement of intent are development of hydrogen economy technologies based on natural gas, decarbonisation of the industry and transport, implementation of the first pilot projects.

The Company alongside with the relevant ministries set up a Roadmap for the development of the technology intensive focus area on Expansion of the Hydrogen Economy, Industry and Transport Decarbonisation based on Natural Gas (hereinafter – Roadmap) to perform the Agreement with due account of the priorities in the hydrogen economy based on natural gas (approved by Alexander V. Novak, the Deputy Chairman of the Government of the Russian Federation, as of 1 December 2021 No. 12937p-P51).

The Roadmap addresses problems defined for the energy industry in the strategic documents of the Russian Federation, including:

- diversifying energy carriers export supplies, increasing the added value of the export energy resources, maintaining demand for natural gas export by developing technologies and projects of low-carbon hydrogen production from the Russian natural gas in maximum proximity to the end users abroad
- achieving the new technology level of the production basis of the Russian FEC and industry, ensuring its competitiveness and stability in the long-term
- creating additional opportunities for development of the power economy, industry, and transport with low level of carbon dioxide emissions
- reducing and preventing anthropogenic carbon dioxide emissions, including expansion of the application scope for energy carriers with low-carbon footprint, and adoption of the best available techniques.

The Roadmap goals are as follows:

- developing competitive domestic technologies of low-carbon hydrogen production from natural gas, hydrogen storage, transportation and use; selecting the optimum projects for technology scaling up and launching the first pilot hydrogen economy projects based on natural gas; formulating government support measures, creating regulatory and legal framework required for hydrogen economy performance and the decarbonisation of the industry and transport based on natural gas
- finding geological structures (including underground gas storages) suitable for carbon dioxide injection and storage, development of economically and technically feasible solutions for carbon dioxide capture, storage, and use
- further gas infrastructure expansion of the power, industry and transport facilities to reduce the total volume of carbon dioxide emissions.

Alexander V. Novak, Deputy Chairman of the Government of the Russian Federation, is the case manager of the technology intensive focus area on Expansion of the Hydrogen Economy, Industry and Transport Decarbonisation based on Natural Gas.

The Ministry of Energy and the Ministry of Industry and Trade of Russia are responsible federal executive authorities for development of the technology intensive focus area on Expansion of the Hydrogen Economy, Industry and Transport Decarbonisation based on Natural Gas.

PJSC Gazprom is a high-tech company in charge for the Roadmap implementation.

Oleg E. Aksyutin, PJSC Gazprom Deputy Chairman of the Management Committee and the Head of the Division, is the Company's official responsible for preparation and implementation of the Roadmap.

Development of hydrogen technologies

The priorities of the hydrogen economy based on natural gas are actualized mainly by R&D, design, engineering and process works as ordered by PJSC Gazprom.

Development of low-carbon hydrogen production technologies through methane pyrolysis are underway. Comprehensive research on the analysis of the hydrogen impact on integrity and stability of the gas supply system was commenced to

assess technical restrictions in transmission and storage of methane-hydrogen mixtures.

Process approaches to production and use of methane-hydrogen mixtures as a fuel are in progress with a goal to reduce carbon footprint and improve efficiency of gas supplies.

PJSC Gazprom in cooperation with PJSC Gazprom Neft explores an opportunity to organize hydrogen-filling infrastructure, including analysis of technical and commercial proposals of the equipment suppliers with a view to build a pilot hydrogen filling station in the Moscow region.

Moreover, PJSC Gazprom Neft conducts research on the development of own hydrogen production technologies with zero carbon dioxide emissions, in particular by methane pyrolysis and hydrogen sulphide decomposition. There are plans for 2022 to complete laboratory stage and start design of pilot units. A separate decarbonisation project with carbon dioxide capture, transportation, use, and injection was initiated.

OOO Gazprom hydrogen was set up to provide a project-based approach to the development of comprehensive process solutions for hydrogen technologies based on natural gas, execution of pilot projects, and creation of innovative equipment prototypes.

PJSC Gazprom collaborates with its Asian and European partners under R&D cooperation programs to identify priority development routes for hydrogen technologies and execute joint projects towards demonstration of natural gas opportunities during transition to low-carbon energy. In 2021, hydrogen technical dialogues were held on a constant basis with Uniper, VNG, Wintershall Dea, Linde, Siemens, OMV, Gasunie, Shell, etc.

Low-carbon development: assessing risks and opportunities

On a regular basis, Gazprom performs risks and opportunities assessment, including climate change one, to make timely well-argued and viable decisions on low-carbon development.

In keeping with recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), Gazprom evaluates its climate risks related to transition to low-carbon economy, and physical risks, namely:

- PJSC Gazprom's natural gas slumping demand due to carbon neutrality trend of some countries
- natural gas to be added to a list of goods liable to carbon regulation
- impact of climatic and natural conditions change on PJSC Gazprom's facilities and infrastructure
- PJSC Gazprom investment potential decline due to changes in the perception of the energy industry.

Risk management executives have been appointed. Each identified risk is subject to qualitative and quantitative assessment.

Qualitative assessment implies calculation of the risk probability, risk impact assessment on people's health and lives as well as the environment, public image, operating and economic performance.

Quantitative assessment applies procedure to evaluate consequences (damage), risk level weight, and to analyze sensitivity to risk factors. Quantitative risk assessment may use scenario analysis.

Risk response practice and internal control procedures have been established. Risk passports have been compiled.

Risk response suggests implementation of the following measures:

- carrying-out the Energy Saving Programs and GHG emissions reduction actions
- adopting the carbon footprint reporting system
- increasing expenditures for development and adoption of new technologies related to production of goods with low-carbon footprint
- diversifying commercial products list (hydrogen fuel, etc.) and markets
- developing and implementing climate change adaptation measures for production facilities
- collaborating with international investors, participating in international sustainable development rankings and scoring, compliance of the Company's public reporting to the international standards in Environmental, Social, and Governance (ESG).

Parallel to risks, the low-carbon trend creates favorable conditions for new opportunities of natural gas use and strengthening of the previously occupied market niche for export gas supplies.

Natural gas keeps the edge in competition with coal, specifically due to low-carbon footprint along the whole process supply chain.

Other opportunities comprise:

- entry into new markets, and natural gas supply via gas trunklines and (or) LNG carriers into countries, which made a decision to exclude coal from its FEC
- increase in the volume and demand for products with high added value on the foreign markets, growth in natural gas products
- maintenance of the natural gas demand due to replacement of coal generation with gas, shut-down of nuclear power plants, gas motor fuel market development
- strengthening national natural gas niches by the gasification of regions and conversion of vehicles to gas motor fuel.

PJSC Gazprom participates in the CDP climate scoring and aim to inform its investors on the Company's low-carbon development plans and achieved results. The Company discloses information on environmental risk management, best available techniques, and efficiency of GHG emissions reduction actions.

In 2021, the Gazprom Group companies were the best among the Russian oil and gas business according to the CDP climate score. In the entirety of disclosed parameters, the Group was included in the B list, while in 4 Categories scores out of 11, namely Scope 1 & 2 Emissions, Governance, Emissions Reduction Initiatives, and Opportunity Disclosure, PJSC Gazprom gained the maximum A score. CDP experts

once again acknowledged that Gazprom makes all possible and coordinated climate protection efforts, completely uncovers credible climate data that investors are interested in, carries out comprehensive work on planning and solving of climate change issues.

Financial impact on the Company due to the climate change, and climate risk response costs were evaluated under the CDP project and given TCFD recommendations.

In pursuance of the task given by the President of the Russian Federation to achieve carbon neutrality in Russia by 2060, and the Long-term Development Strategy of the Russian Federation with Low Greenhouse Gas Emissions up to 2050, the year 2021 saw developing of PJSC Gazprom's 2050 Sustainable Development Scenario in the light of the low-carbon trend of the global economy. R&D activities performed in the course of scenarios scripting investigated the issues of evaluating the low-carbon economy trend impact on the energy markets development, including natural gas market. R&D as well analyzed adaptation strategies of the global energy companies and partners of PJSC Gazprom.

Finally, there will be a Climate Strategy and Roadmap with set climate goals, recommendations and proposals for all PJSC Gazprom's businesses. In 2022, there are plans to finalize the 2050 Climate Roadmap of PJSC Gazprom.

Today, Gazprom implements the GHG Emissions Management System Roadmap for the Gazprom Group Companies up to 2030. This Roadmap specifies GHG carbon intensity reduction targets, and measures to achieve them.

Gazprom performs its activities with due regard of the planned (target) key performance indicators, including GHG emissions reduction values.

In 2021, GHG carbon intensity reduction against a 2018 baseline (key performance indicator of PJSC Gazprom) totaled 2.6%.

GHG emissions reduction during natural gas transmission per commodity transport activity against a 2018 baseline – 55.3 tons of CO_2e / bcm · km is one of the target values specified by the Gazprom's Corporate Environmental Goals for 2020–2022. In 2021, it totaled 52.25 tons of CO_2e / bcm · km, thus the goal was achieved.

GHG carbon intensity reduction targets (CO_2e) in 2021-2032 against a 2018 baseline, %

Types	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Gas business	1.5	1.9	2.3	2.7	3.1	4.2	5.4	6.6	8.1	9.7	11.2	12.1
Electrical power business	5.5	6.2	6.8	7.4	7.7	8.1	8.4	8.7	9.0	9.3	9.6	9.9

Annual values analysis indicates that actual values are ahead of the targets.

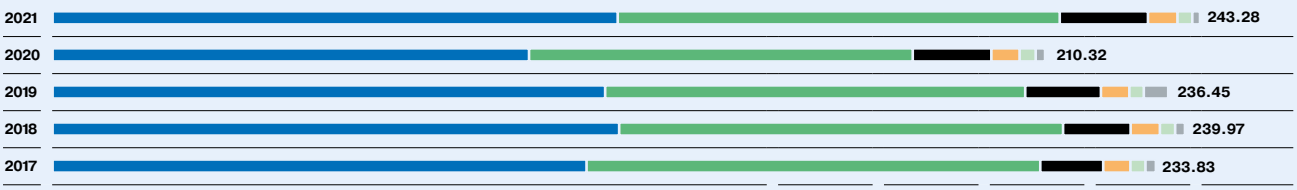
Greenhouse gas emissions

Carbon dioxide and methane are the main greenhouse gases emitted as the result of Gazprom's business activities.

PJSC Gazprom uses Methodological Guidance on the Quantification of Greenhouse Gas Emissions by Entities engaged in Business and other Activities in the Russian Federation to perform quantitative assessment of GHG direct emissions[4].

In 2021, GHG emissions (Scope 1) of the Gazprom Group totaled 243.28 mln tons of CO_2e.

Gazprom Group's GHG emissions, 2017–2021, mln tons of CO_2e



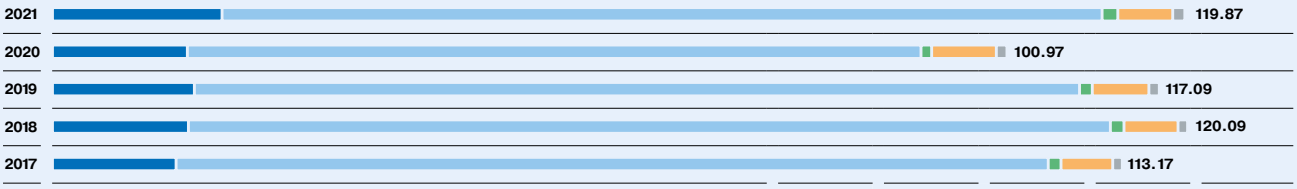
	2017	2018	2019	2020	2021
PJSC Gazprom	113.17	120.09	117.09	100.97	119.87
Gazprom energoholding	96.17	94.06	89.03	81.32	93.65
Gazprom Neft Group	13.31	14.33	16.04	16.65	18.73
Gazprom neftekhim Salavat	5.75	6.18	6.04	6.01	6.23
Sakhalin Energy	3.22	3.25	3.05	3.40	3.15
Other companies	2.21	2.06	5.20	1.97	1.65

The Gazprom Group companies regularly perform quantitative assessment and analysis of GHG emissions, adopt innovative projects and BATs, carry out efficiency assessment and analysis of GHG emissions reduction activities, and develop the update of climate goals and missions for the future in adherence to the corporate GHG emissions management system.

In 2021, energy saving actions prevented 31.39 mln tons of CO_2e in GHG emissions.

Increase in GHG emissions is mainly associated with the growth of production indicators due to returning to previous natural gas consumption and sales volumes after COVID-19 pandemic as well as commissioning of new fields.

GHG emissions dynamics at PJSC Gazprom by types of activities, 2017–2021, mln tons of CO_2e



	2017	2018	2019	2020	2021
Production	13.07	14.39	15.01	14.27	17.95
Transmission	92.28	97.52	93.65	77.61	93.09
Underground gas storage	1.34	1.44	1.33	1.13	1.66
Processing	5.46	5.71	5.99	6.83	5.90
Other types of activities	1.02	1.03	1.11	1.13	1.27

[4] Approved by the Order No. 300 of the Ministry of Natural Resources and Environment of the Russian Federation as of 30 June 2015.

However, in 2021, PJSC Gazprom demonstrated reduction in methane emissions by 40 thousand tons as compared to 2020. Natural gas conservation during repair works at LSs of GTLs made the main contribution into methane emissions reduction.

PJSC Gazprom's business activities imply constant environmental management advancement, including application of the best practices on methane emissions reduction. A set of actions aimed at methane emissions reduction is enforced through the GHG Emissions Management System Roadmap for the Gazprom Group Companies up to 2030, innovative development programs up to 2025, and energy saving and energy efficiency improvement programs.

GHG emissions from PJSC Gazprom facilities in 2021 totaled 119.87 mln tons of CO_2e, with 20.5% of methane.

Dynamics of methane emissions by types of PJSC Gazprom activities, 2017-2021, thousand tons*

Type of activity	2017	2018	2019	2020	2021
Production	51.32	49.76	51.99	47.72	59.84
Transmission	1,238.74	1,229.48	1,242.82	952.65	897.34
Processing	1.08	1.21	1.19	1.25	1.10
Underground storage	19.54	18.86	15.97	16.63	19.98
Other	1.15	0.83	1.95	2.43	2.80
Total	1,311.83	1,300.14	1,313.92	1,020.68	981.06

* As contemplated 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 Ministry of Natural Resources and Environment of the Russian Federation as of 30 June 2015 No. 300.

Currently methane emissions make 0.02% of the produced gas, 0.19% of the transmitted gas, and 0.03% of the stored gas at PJSC Gazprom's gas production, transmission, and storage facilities, respectively.

PJSC Gazprom takes comprehensive measures to evaluate, account, and monitor atmospheric methane emissions. This work is organized in view of the government regulations, including EP regulatory actions, government environmental oversight, state accounting and reporting, methane environmental fees.

PJSC Gazprom worked out a family of corporate standards on accounting, quantitative assessment and monitoring of methane emissions, including natural gas leaks. Fulfillment of legislative requirements, provisions of regulatory documents, guidelines, and standards is controlled by a special-purpose inspection of OOO Gazprom gaznadzor. Inspection results are submitted to PJSC Gazprom's Administration for timely managerial decisions.

PJSC Gazprom endeavors to improve the quality of data on methane emissions during natural gas operations along the whole process chain. Every year the Company performs an independent assurance report on methane emissions with the involvement of the international audit company KPMG.

The year 2021 saw completion of the methane emission factor update related to natural gas operations during GTL transmission. This work was done on the basis of actual physical and chemical parameters of the marketable natural gas, measurement data, and quantitative assessment of methane emissions from gas transmission facilities. Adjusted national methane emission factor adequately featured operation and process specifics of natural gas transmission through GTL, outlined high technology level of the Russian gas industry, and reduced uncertainty of GHG actual data in the National Inventory of the Russian Federation.

In 2021, PJSC Gazprom continued to execute methane emissions monitoring and measurement project for the Company's main business activities with the use of airspace technologies with the purpose of actual data reporting on methane emissions.

PJSC Gazprom's facilities are located on territories with numerous natural emission sources – wetlands and permafrost. The majority of third-party researches don't take into account these factors in the assessment of industrial emissions. Space data verification points are not located in such areas. Detection of emission sources and their quantitative assessment require in-house research on verification and procedure development for data processing and verification.

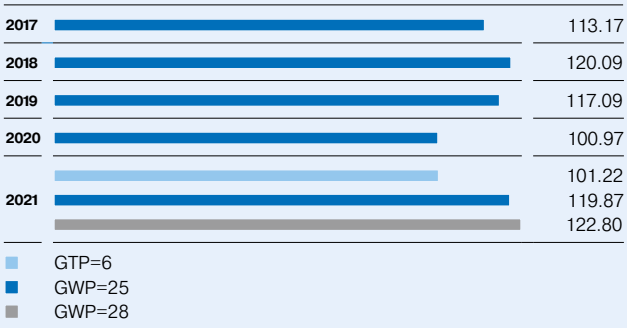
In 2021, OOO Gazprom transgaz Moskva, AO Gazprom space systems, and OOO Gazprom VNIIGAZ performed joint surface measurements of methane concentrations to confirm possibility of leaks detection from GTL by a satellite gas detector. During experiment, methane leak was simulated by gas discharge at a certain rate. The experiment involved space imaging with satellite gas detector installed on a space vehicle. R&D results will be used to develop methane emission control and assessment technology able to distinguish between possible emission sources and calculate volumes. In the future, satellite gas detectors will be installed onboard of SMOTR-V space vehicles that are going to be used in detection of methane emissions on GTL routes as well as on oil and gas industry facilities and equipment locations.

GHG emissions at PJSC Gazprom by emission source categories (Scope 1), 2021, mln tons of CO_2e

Sources (processes)	Total	CO_2	CH_4
GHG emissions, total	**119.87**	**95.34**	**24.53**
Stationary fuel combustion	88.93	88.93	0.00
Flaring	2.57	2.49	0.08
Fugitives	24.45	0.00	24.45
Other industrial processes	3.82	3.82	0.00
Air transport	0.07	0.07	0.00
Railway transport	0.03	0.03	0.00

Global warming potential (GWP) values are revised in a series of reports by the Intergovernmental Panel on Climate Change (IPCC). As part of the development of the IPCC's Sixth Assessment Report[5] using the GWP value for methane over a 100-year period was recommended. Methane has a GWP-100 of 28.

GHG emissions dynamics at PJSC Gazprom, 2017–2021, mln tons of CO_2e



The use of the global temperature change potential (GTP) over a 100-year period in accordance with IPCC recommendations, and with the decision of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement[6] provides more credible data on GHG emissions impact on the climate system. Thereby, conversion factor 6 is used to evaluate methane (CH_4) emissions in CO_2e.

With due regard to a GTP, in 2021 GHG emissions of the Gazprom Group totaled 223.82 mln tons of CO_2e, and GHG emissions of PJSC Gazprom – 101.22 mln tons of CO_2e.

The most promising GHG emissions reduction is focused in projects, technologies and actions in the gas transmission subsidiaries of PJSC Gazprom.

Technologies of natural gas supply to consumers via GDSs, bypass of gas from the repaired section to the operated gas pipeline, use of gas from process piping of the compressor shop for own needs are providing the main share of methane emissions reduction.

The MCS adoption project aimed at prevention of methane venting (as GHG) into the atmosphere during repair works on GTLs is the most significant project of today. The volume of gas saved in 2021 during such repair works is estimated at 1.91 bcm. Approximately 28% of that saved volume was due to reaching the project capacity by MCSs, which helped to pump and save 744.72 mln m^3 of natural gas.

Indirect GHG emissions (Scope 2) related to electrical power, heat or steam generation purchased from third-party companies are calculated for the whole production chain of PJSC Gazprom by types of activities, and by the Group's companies.

Indirect energy GHG emissions at PJSC Gazprom by types of main activities (Scope 2), 2021, mln tons of CO_2e

Production	0.35
Transmission	2.47
Processing	1.83
Underground storage	0.05

Indirect energy GHG emissions at the Gazprom Group companies (Scope 2), 2021, mln tons of CO_2e

PJSC Gazprom	4.7
Gazprom energoholding	0.0
Gazprom Neft Group	5.1
Gazprom neftekhim Salavat	2.6

The Gazprom Group evaluates GHG emissions as a result of products use as a fuel or feedstock both in Russia, and abroad (Scope 3). Emissions calculation is done for all types of sold products: natural gas, oil and gas condensate, petrol, diesel and jet fuel, liquefied hydrocarbon gases, oil residue.

[5] https://www.ipcc.ch/report/ar6/wg1/
[6] Resolution 18 / CMA.1 Appendix 37.

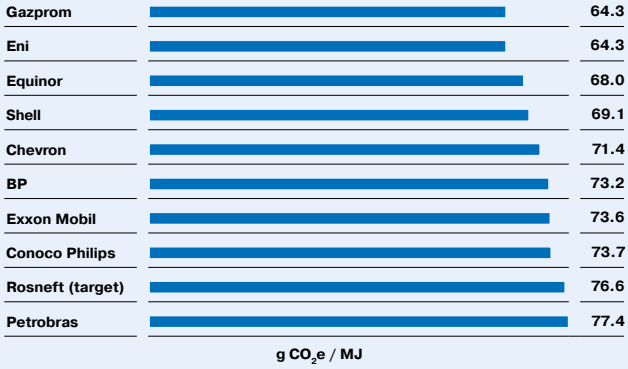
GHG emissions due to the use of products sold by the Gazprom Group (Scope 3), 2021, mln tons of CO_2e	
Natural gas	932.48
Oil and gas condensate	77.94
Other energy resources	140.33
Total	1,150.75

Carbon intensity of the Gazprom Group's products combusted by the end users is 301.21 kg CO_2 / bbl o.e.

PJSC Gazprom's business model is largely adjusted to low-carbon trend of the global economy development, as it includes main activities on production, transmission, storage, processing, and use of natural gas – the most low-carbon fuel out of existing fossil fuels.

Due to predominant share of natural gas in the products portfolio, and implementation of GHG emission reduction measures, the Gazprom Group demonstrates one of the lowest carbon footprint values of its products among major oil and gas industry companies. In 2020, the Gazprom Group displayed considerably lower carbon intensity (64.3 g CO_2e / MJ) in the Transition Pathway Initiative (TPI) score than other majors.

Carbon intensity of the majors, 2020, g CO_2e / MJ



Source: www.transitionpathwayinitiative.org/sectors/oil-gas

Use of renewable and secondary energy sources

The Gazprom Group supports and exerts 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 own needs and sales to external consumers. Solar and wind generators, gas flow heat and energy power converters are widely applied at production and gas trunkline transmission facilities as well as gas distribution networks to provide current power supply to telemetry systems, cathodic protection of pipelines, lighting, etc.

In 2021, PAO TGK-1 (Gazprom energoholding) and OOO Nugush hydroengineering complex (Gazprom neftekhim Salavat) generated 13.15 bln kWh of power. The main production volume is accounted for the hydroelectric power plants (HPP) of PAO TGK-1 that contribute significantly to the green power industry of the North-West Federal District of Russia (40% of installed PAO TGK-1 capacity is accounted for hydrogeneration, namely 40 HPPs with a total capacity of approx. 2,900 MW).

In 2021, PAO TGK-1 joined the I-REC Standard Foundation as a renewable energy producer, and gained the right to issue I-REC certificates on electrical power generated by HPP that were certified and registered in the Goal Number Seven, the Association of Energy Markets Participants.

In 2021, the Gazprom Group used 2,732 RES- and SES-based power units, exclusive of hydroelectric ones, such as turbo-expanders, thermoelectric generators, solar modules and cells, wind generators. Cumulative volume of electrical power generated by these power units totaled 5,649.8 thousand kWh.

A marked increase in electrical power generation in 2021 is associated with commissioning of thermoelectric generators at PJSC Gazprom's companies.

PJSC Gazprom Neft successfully implements pilot projects on alternative energy sources and digitalization of power facilities at oil refineries (OR). The company develops RES-based generation. The Omsk OR operates a solar power plant (SPP) with 1 MW of installed capacity. In 2021, actual power generated by SPP at the Omsk OR, the construction of which was completed in 2019, totaled 1,161.3 thousand kWh. The year 2021 saw approval of design and survey works aimed at SPP capacity increase up to 20 MW.

In the reporting year, SPP at the Omsk OR was certified and included in the international register of RES facilities (I-REC1) thus enabling issuing of green certificates aiming at carbon footprint reduction. The near future RES projects of the Omsk OR will not only improve energy efficiency and environmental operation indicators, but also monetize. This proves collateral effects from RES facilities construction.

PJSC Gazprom Neft logistics, processing, and marketing module analyzed economic feasibility of RES projects implementation for over 50 sites. The company identified preferred sites with the best economic prospects.

Electrical power generation from renewable and secondary energy sources at the Gazprom Group, 2019–2021

	Electrical power generation, kWh			Number of units, pcs.		
Generation type	2019	2020	2021	2019	2020	2021
All RES and SES types	**11,703,054,790.2**	**13,281,763,422.66**	**13,156,049,550.78**	**2,358**	**2,689**	**2,848**
incl. PJSC Gazprom	557,958.2	589,444.67	4,236,483.34	1,585	1,641	1,686
Turbo-expanders	**74,679.0**	**105,257.76**	**77,378.90**	**21**	**18**	**22**
incl. PJSC Gazprom	74,679.0	105,257.76	77,378.90	21	18	22
Thermoelectric generators	**257,431.7**	**258,061.96**	**3,949,184.66**	**820**	**830**	**872**
incl. PJSC Gazprom	257,431.7	258,061.96	3,949,184.66	820	830	872
Solar and wind generators	**354,136.5**	**1,441,921.94**	**1,623,258.22**	**1,399**	**1,725**	**1,838**
incl. PJSC Gazprom	225,847.5	226,124.96	209,919.78	744	793	792
Hydroturbines	**11,702,368,543.0**	**13,279,958,181.00**	**13,150,399,728.00**	**118**	**116**	**116**
incl. Gazprom energoholding	11,673,658,262.0	13,248,799,100.00	13,130,080,629.00	115	113	113
Gazprom neftekhim Salavat	28,710,281.0	31,159,081.00	20,319,099.00	3	3	3

In 2021, six equipment sets for automated operation control and management of gas wells with concentric tubings with power supply from independent supply sources were adopted on the Medvezhye OGCF. Three sets will be solar- and wind-powered. Such equipment will prolong well production life, help to avoid construction of additional electrical grids, reduce gas consumption for own needs, and carbon dioxide emissions into the atmosphere.

PJSC Gazprombank built the largest in Russia RES project financing portfolio with a total of 3.7 GW. OOO Messoyakhaneftegaz (joint venture of PJSC Gazprom neft and PJSC Rosneft) commissioned geoseismic monitoring system for the APG underground storage on the Zapadno-Messoyakhskoye field. The system provides round-the-clock detailed operation data about the operation of the storage that is located in the undeveloped formation with an oil rim. The system uses energy from the Arctic sun. Solar batteries provide power to the system. Stable operation of the system is controlled by UAVs that provide regular infrastructure monitoring.

Scientific and technical support of environmental protection

Innovative research and development

The Gazprom Group companies place special emphasis on financing and promotion of the innovative scientific research, development and introduction of the best practices and technologies to focus on minimization of industrial impact on the environment and climate.

Environmental safety and energy efficiency of the Gazprom Group's business activities are mainly improved through introduction of innovative technological and process solutions.

PJSC Gazprom's 2025 Innovative Development Program contains a series of interrelated actions aimed at creation and adoption of new technologies, innovative products and services, which are in line with the global level or even outreach it. The Program also creates favorable conditions for innovative activities expansion both at the Gazprom Group, and in related sectors of the Russian industry production.

Innovative technologies and equipment adoption is organized system-based at PJSC Gazprom.

In 2021, the Gazprom Group completed R&D environmental protection and energy efficiency works priced at RUB 317 mln, including the efforts pursued by the corporate scientific research institutes – OOO Gazprom VNIIGAZ and OOO NIIgazekonomika.

Range of activities and immensity of tasks that the Gazprom Group companies face can be judged by the topics of R&D projects carried out in 2021.

For the first time in Russia, OOO Gazprom VNIIGAZ estimated environmental effect from the conversion of motor vehicles to GMF and hybrid energy carriers (including hydrogen fuel cells). Estimation also covered an effect from e-vehicles in the regions of Russia. The company performed ecological and economic evaluation of the energy carriers' life cycle for NGVs, hybrid (including hydrogen fuel cells), and e-vehicles. The work assessed an impact of separate stages and the whole life cycle (production, storage, including hydrogen fuel cells) of hybrid vehicles and e-vehicles on the environment, climate, and population. It also provided environmental and economic assessment of the efficiency of vehicles conversion to GMF and alternative energy carriers.

The year 2021 saw completion in the development of the Unified Design and the Library of Process Patterns under the System of Selective Catalytic Reduction of Nitrogen Oxides in GCU Exhaust Gases. This system intentionally reduces nitrogen oxides content in exhaust gases of a gas turbine to values that don't exceed European (EU) BAT standards.

Gazprom takes active part in the global process to define the place of natural gas in the power industry and global economy.

Evolution of nature-like technologies for gas industry needs is one of the focal areas for R&D works financed by PJSC Gazprom and implemented by OOO Gazprom VNIIGAZ. In particular, creation of effective bioprotein (new product from natural gas) production technology is ongoing. Relatively cheap feedstuff with at least 70% protein content ensures food security of the country, and diversifies PJSC Gazprom business allowing for maximum rational use of the fields with declining production. There are plans to set up a pilot research facility for scaling and validation of the production technology of biological products, including production of bioprotein from natural gas.

The corporate regulatory document – R Gazprom "Methodical guidelines on the selection of oil spill response method for the Arctic zone of the Russian Federation during oil spill response plan development based on environmental impact assessment" was developed in 2021. R Gazprom "Workflow organization and execution for storing liquid hydrocarbons in underground reservoirs built in permafrost formations" was developed to enhance reliability and environmental safety. It contains recommendations on design, construction, and operation of underground liquid hydrocarbon storages in permafrost.

The trend towards low-carbon energy sources reinforced hydrogen's role as an energy resource. Hence, the gas industry encountered additional opportunities for methane as a feedstock for hydrogen energy carriers (hydrogen, methane-hydrogen fuel, etc.). In adherence to the resolution of PJSC Gazprom's Board of Directors, the Company is advancing some focal areas of the hydrogen economy based on natural gas:

- developing the technologies of hydrogen production out of natural gas with no carbon dioxide emissions and further implementation of hydrogen commercial production projects
- assessing comprehensively hydrogen impact on integrity and stability of the gas supply system to judge upon the possibility of methane-hydrogen mixtures transmission as well as drawing up regulatory and technical proposals
- producing and using methane-hydrogen fuel in GCU gas turbine engines and power generation
- building up capacities at gas processing facilities designed to bring the quality of hydrogen-containing gas to consumer's requirements, and the corresponding hydrogen storage and shipment infrastructure.

In broader terms and in recent times, development prospects of the energy companies are increasingly determined by the carbon intensity level of the main production processes, which proves the growing relevance of development and advancement in the GHG emissions management system.

PJSC Gazprom engages institutes of the Russian Academy of Sciences to research of problems related to the low-carbon economy adaptation technologies. R&D project on the Estimation of Methane Impact on the Climate Change upleveled validity of managerial decision-making in oil and gas production by using science-based approaches and update of national methane emission factors. Saint-Petersburg State University (the Institute of Advanced Professional Education "Higher School of Economics") in cooperation with OOO Gazprom VNIIGAZ work out a Climate Strategy and a Climate Roadmap.

OOO Gazprom VNIIGAZ completed the following R&D energy saving works:

- Development of PJSC Gazprom Energy Saving and Energy Efficiency Improvement Programs up to 2025; adjustment of PJSC Gazprom's regulatory documentation on energy efficiency and energy saving
- Development of proposals on introduction of innovative energy saving technologies in natural gas production and transmission, evaluation of energy saving potential when executed
- Analysis and entering of adjustments into PJSC Gazprom Energy Saving and Energy Efficiency Improvement Program

2022, Development of PJSC Gazprom Energy Saving and Energy Efficiency Improvement Programs for 2022–2024.

OOO NIIgazekonomika carried out the following R&D projects in legal, environmental and economic regulation:

- Estimation of gas reserves potential in the gas transmission system to cover irregular gas consumption in peak gas consumption periods depending on duration of the period, season, considered subsystem of the Unified Gas Supply System
- Study and cost-effectiveness analysis of PJSC Gazprom's Energy Saving and Energy Efficiency Improvement Program for 2022–2024
- Development of methodological approaches to formulation of technical and economic proposals on priority projects for adoption of energy effective and energy saving technologies through energy service contracts
- Development of methodological approaches to cost-effectiveness analysis of PJSC Gazprom's Energy Saving and Energy Efficiency Improvement Program based on the information on energy saving actiones taken in 2021–2023.

Evaluation of the Company's R&D project deliverables and innovative products of external parties is used in development of the Register of Innovative Products.

At the beginning of 2021, PJSC Gazprom's Resolution No. 34 greenlighted an Action Plan for introduction of innovative products. It encloses actions to adopt the most effective innovative solutions from the Register of Innovative Products.

It is worth mentioning that not each innovation is aimed at reaching considerable economic effect, as often utmost importance goes to safety of process flows and HSE.

Use of the best available techniques

The best available technique (BAT) – technique of outputs (goods) production, works execution, and services rendering defined by present-day achievements of science and technology, and the best combination of EP goal criteria provided that there are technical capacities for its application.

Recent years have witnessed tightening of the environmental policy in Russia. The Federal Law No. 219-FZ as of 21 July 2014 obliges the entities falling under the BAT scope to obtain complex environmental permits. PJSC Gazprom demonstrated its commitment to BAT principles even before amendments to the Federal Law on Environmental Protection entered into force in 2014.

"Use of the best available techniques at different stages of business activities, including procurement of technologies, materials, and equipment" is one of the key mechanisms in fulfillment of environmental obligations that is entrenched in PJSC Gazprom's Environmental Policy.

Implementation of the BAT Transition Roadmap aimed at development of the package of measures for BAT adoption and use by PJSC Gazprom is underway at the Company.

The Company also developed a family of corporate regulatory documents, including a standard – STO Gazprom 12-2.1-024-2019 Regulatory environmental protection documents. Gas supply system. Operational environmental control. Basic requirements, and recommendations – R Gazprom 12-2.1-025-2019 Regulatory Environmental Protection documents. Gas supply system. Methodological recommendations for developing Complex Environmental Permits.

In 2021, PJSC Gazprom's subsidiaries (OOO Gazprom dobycha Urengoy, OOO Gazprom dobycha Yamburg, and OOO Gazprom pererabotka) obtained four complex environmental permits for their industrial facilities.

In business activities, PJSC Gazprom and its subsidiaries rely on best available techniques reference documents (BREF-ITS) of the Federal Agency on Technical Regulation and Metrology: ITS-29-2017 Natural gas production and ITS-50-2017 Natural and associated gas processing. ITS-50-2017 is an effective tool for BAT practical application. All technologies are registered and comply with 16 BATs at the Company's processing facilities: pre-transport condensate treatment plant, helium plant, the Astrakhan GPP, the Amur GPP, the Orenburg GPP, the Sosnogorsk GPP, the Surgut condensate stabilization plant.

Practical application analysis of BREFs developed in 2017 revealed the need for additional expert appraisals of technologies employed at PJSC Gazprom's gas production and processing facilities.

PJSC Gazprom has a vast experience in BAT implementation that will be used in industry documents development. Currently, OOO Gazprom VNIIGAZ develops a package of EP regulatory documents to enable PJSC Gazprom's transition to BAT-oriented technology regulation principles:

- STO Gazprom Regulatory environmental protection documents. Gas supply system. Air protection. Regulation of pollutant emissions. Basic requirements
- STO Gazprom Regulatory environmental protection documents. Gas supply system. Catalogue of environmental parameters of gas transport equipment
- STO Gazprom Regulatory environmental protection documents. Environmental management system. Organization and procedure of environmental control.

The year 2021 saw completion of measures on PJSC Gazprom's transition to BAT-based technology regulation. The work deliverables contain proposals for updating federal and corporate BREFs on natural gas production, processing, transmission, and underground storage.

PJSC Gazprom's Science and Technology Prize

PJSC Gazprom's Science and Technology Prize is awarded annually since 1998 for outstanding projects in production, transportation, storage, processing, and use of natural gas, gas condensate, and oil that culminated in creation, upgrading, and most significantly effective application of new technologies, tools, equipment, and materials. This award 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.

Submitted works are reviewed by the expert group represented by specialists from PJSC Gazprom and its subsidiaries. Experts evaluate projects relevance, novelty, and technical level (research intensity), scope and scale of application as well as financial viability of their use at PJSC Gazprom, commercialization potential, protective power, and extent of application of home-produced materials, technologies, and equipment.

In 2021, 16 projects from 23 Gazprom's companies and 15 external organizations prepared by 148 authors were nominated for the Prize. The majority of projects among ten Prize winners have direct or indirect environmental effect.

Development and introduction of innovative well repair method to reduce greenhouse gas emissions and negative impact on the environment

Nominee – OAO Severneftegazprom.

The authors developed an innovative manual arc welding repair technology for a threaded joint "collar sleeve – tubing head nipple". It was qualified at the National Agency of Welding Control. Introduction of this repair method significantly cut down expenditures, reduced duration of works, put away the need for well killing, mitigated GHG emissions and negative environmental impact.

Innovative well repair method received an invention patent.

A procedure to ensure required safety level for compressor station pipelines with the use of robotic inspection suites

Nominee – OOO Gazprom transgaz Yugorsk.

The authors developed a procedure to ensure required safety level for CS process pipelines under time and financial restrictions based on inline robotic inspection suites. The authors' robotic suite is designed for inline quality control of the parent metal of fittings and welded joints with an outer diameter from 400 to 1,400 mm, and wall thickness from 6 to 40 mm. Small sizes of the scanning flaw detector allow for it positioning inside the pipe through manways, unsealed covers of backpressure valves, and working holes 300×250 mm in size. Flaw detector assists in evaluation of the technical state of pipeline systems with complex configuration.

The project received four patents of the Russian Federation.

Development and introduction of innovative data processing algorithms for ultrasonic testing and inspection of pipelines of the Unified Gas Supply System based on computational performance evaluation during repair and operation of PJSC Gazprom's facilities

Nominee – OOO Gazprom transgaz Chaykovskiy.

The authors developed home equipment, and adopted new technologies for manual, mechanical, and automated ultrasonic inspection of pipeline welded joints and parent metal, and other PJSC Gazprom's facilities. It has been established that multicomponent systems (acoustic modules) and software automation of ultrasonic non-destructive testing results registration and interpretation considerably reduce testing quality time. Processing procedure for obtained results based on computational performance evaluation greatly reduces scope of repair and joint cutting without any negative impact on pipeline reliability.

The project received one invention patent, and one software state registration certificate.

Comprehensive system research of hazardous hydrometeorological, ice, and lithodynamic phenomena on the Sakhalin shelf of the Sea of Okhotsk

Nominee – OOO Gazprom VNIIGAZ.

For the first time ever, the authors developed and implemented a procedure for full-scale comprehensive studies of hydrometeorological, ice, and lithodynamic natural conditions on the whole water area of the Sea of Okhotsk based on the offshore reanalysis concept. Unique

hydrometeorological data volumes, including ice cover parameters used in maintenance and repair of the subsea production unit facilities of the Kirinskoye GCF have been obtained. The Yuzhno-Kirinskoye OGCF received credible evaluation of performance parameters that can be directly used in drilling-out planning for production well stock and in design of field infrastructure facilities.

The project received one software state registration certificate.

A package of R&D solutions for energy efficiency improvement of the gas heating technology at GDSs

Nominee – OOO Gazprom transgaz Ukhta.

The work's relevance is determined by the need to upgrade and optimize heating processes for transmitted gas at a GDS to improve energy efficiency. Novelty of the basic R&D idea consists in application of new and more reliable control methods for performance attributes of the heat medium, and upgrading of gas heater cleaning devices used in technical maintenance and repair. The authors created new and not previously applied in Russia technology for cascade control of gas heaters in groups, and cascade pressure reduction in offshoot pipelines at GDSs by line pressure reduction spools. Work deliverables can be used in new building, re-equipment and overhaul repair at existing and future PJSC Gazprom's GDSs for energy efficiency improvement of gas heating before pressure reduction spools, decrease in gas consumption for own needs, and mitigation of pollutant emissions.

International cooperation

International cooperation, sharing experience and best practices paves the way to business growth, specifically in energy efficiency improvement and EP.

Role of natural gas in low-carbon development

In 2021, Gazprom continued low-carbon development dialogues under R&D cooperation with BASF/Wintershall Dea AG, N.V. Nederlandse Gasunie, Uniper SE, KOGAS, Linde AG, Royal Dutch Shell, Mitsubishi, ENGIE SA, and CNPC. Special attention was drawn to unbiased estimate of the carbon footprint of the Russian natural gas supplies, reduction in GHG emissions, control, registration, monitoring, preparation and verification of reports on methane emissions, detection of methane leaks and repairs.

Together with CNPC the Company planned joint comprehensive work on biological methods of environmental protection from hydrocarbon pollutions.

Mitsubishi, Wintershall Dea, Linde, ANDOC, and Gazprom discussed probability of evaluation of CO_2 sequestration potential in Russia and proposed specific UGSs to promote carbon capture, use and storage technologies (CCUS).

On the 8th of March, the Gazprom Group made the first supply of carbon-neutral LNG in the Atlantic. In adherence to the Agreement terms, PJSC Gazprom and Royal Dutch Shell will jointly compensate carbon footprint of the freight by emissions certificates such as Verified Carbon Standard (VCS) and Climate, Community & Biodiversity standard (CCB). The project's CO_2 emission allowances will be paid off. It means that LNG supplied under the Agreement becomes carbon-neutral during its whole life cycle: from recovery and production to transportation and end use. Further carbon-neutral LNG supplies were negotiated with Royal Dutch Shell and Sakhalin Energy. In tandem with the International Group of Liquefied Natural Gas Importers (GIIGNL) Gazprom participates in the development of a single terminology and emission calculation procedure for a stepwise emissions measurement, reporting and verification (MRV) system to ensure carbon-neutral LNG supplies.

Collectively with DBI Gas- und Umwelttechnik GmbH (DBI GUT), the German Technical and Scientific Association for Gas and Water (Deutscher Verein des Gas- und Wasserfaches, DVGW), and the Federal Ministry of Economic Affairs of Germany, PJSC Gazprom drafted an international project on Measurement of Methane Emissions from the Russian Gas Producing Facilities.

Gazprom's representatives took part in the work of the Methane Emissions Work Group of the International Gas Union (IGU).

Gazprom was an active participant to the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow, where the Company submitted its observations related to natural gas contribution into the problem solution of the global energy demand growth with simultaneous transition to the green energy. Special sessions during Energy Day, Business Day, and Sustainable Investment Day were organized in the Russian Pavilion to promote environmental advantages of natural gas.

Gazprom took part in public consultations of the European Commission concerning draft Regulation on methane emissions reduction in the energy sector.

Gazprom delivered report on the role of natural gas in low-carbon development, coal replacement with natural gas, and comparison of energy sources by energy return on energy invested at the session of the Association of European Businesses.

In 2021, Gazprom made preparations to join the Oil & Gas Methane Partnership (OGMP) – initiative of the UN Environmental Program, and reporting to OGMP 2.0.

Gazprom continues its work in the Methane Guiding Principles Partnership (MGP). The Company reported on methane emissions and methane reduction measures at Gazprom's facilities in 2020.

Today investor groups pay considerable attention to ESG agenda. For example, Gazprom provided GHG emission calculations made under the Transition Pathway Initiative (TPI) to Climate Action 100+ (CA100+).

In terms of disclosure on sustainable development scenarios and GHG emissions reduction, Gazprom actively collaborates with such rating agencies as Fitch Ratings and CDP.

Hydrogen technologies

Hydrogen energy remains one of the most internationally discussed areas of cooperation. During the year, business expert meetings on the hydrogen economy were held regularly in online format highlighting such topics as scientific and technical aspects of production, transportation, storage, distribution and use of hydrogen and hydrogen energy carriers (methane-hydrogen mixtures and ammonia). Experts discussed risks, legal aspects and rules governing the transportation of hydrogen in the form of a methane-hydrogen mixture through existing gas transmission systems.

Together with the Asia-Pacific region countries, Gazprom negotiated active cooperation on joint pilot projects related to the hydrogen economy and decarbonisation of industry and transport based on natural gas.

In September 2021, Gazprom and the Japanese Ministry of Economy, Trade and Industry signed a Memorandum of Cooperation that covered hydrogen, ammonia, capture, storage and use or processing of carbon dioxide. The Memorandum implies the development of cooperation between Gazprom and the Japanese companies in this area.

Participation in the project on production, storage and transportation of blue ammonia from the Baltic Sea coast of Russia to the EU countries was reviewed with ITOCHU. The discussion also outlined specifics of supplied ammonia in terms of its low-carbon recognition criteria in the EU.

In October 2021, the Gazprom Group signed an Agreement on the Company's participation in the international R&D consortium to implement the HySTORAGE project for testing the possibility of safe storage of methane-hydrogen mixtures in UGS.

In 2021, together with the European partners Gazprom implemented a project to evaluate technologies and GHG emissions in the natural gas production chain for various hydrogen and methane-hydrogen fuel production, transportation, and use patterns in Central Europe. Research deliverables demonstrate the best model of PJSC Gazprom's export activities for the development of the European Union hydrogen market is when natural gas is transmitted through the existing gas transmission system followed by subsequent production of low-carbon hydrogen or methane-hydrogen mixtures near the European end-user, such as power generation facilities and steelmaking industrial enterprises. Natural gas is characterized by considerable market flexibility because it can be used as an energy resource or as a feedstock for hydrogen production. Low-carbon hydrogen production (primarily – methane pyrolysis) needs to be developed to implement this model.

As part of R&D cooperation with foreign partners, PJSC Gazprom launched the work on priority issues of hydrogen technology development and joint projects to demonstrate the potential of natural gas in the hydrogen economy.

Technical dialogues with BASF/Wintershall Dea GmbH, N.V. Nederlandse Gasunie, VNG Gasspeicher GmbH, Uniper SE, OMV Aktiengesellschaft, CNPC, KOGAS, Linde AG, and the Agency for Natural Resources and Energy of Japan (Kawasaki Heavy Industries, Mitsubishi Corp., Mirai Energy, ITOCHU and others) discussed prospective areas of cooperation:

- explore a possibility of a joint project for the production of low-carbon hydrogen from natural gas in the EU with subsequent CO_2 use/sequestration (under R&D cooperation with BASF/Wintershall Dea GmbH)
- explore a possibility to supply low-carbon hydrogen and hydrogen energy carriers produced from natural gas to the Republic of Korea (under R&D cooperation with KOGAS)
- study prospects of large-scale hydrogen production in Germany with further sale of carbon dioxide as well as the use of salt caverns for hydrogen storage (under R&D cooperation with VNG with the participation of the Russian-German Raw Materials Forum)
- evaluate promising technologies for hydrogen production from PJSC Gazprom's natural gas, hydrogen transportation and storage in salt caverns and porous formations in China as well as a possible joint pilot project with Chinese companies (under R&D cooperation with CNPC)
- feasibility study on ammonia production and transportation from the Russian Far East to Asian countries (under R&D cooperation with the Agency for Natural Resources and Energy of Japan)
- assessment of the carbon footprint of various low-carbon hydrogen and/or ammonia supply options from the Far East to Japan, including comparison with natural gas supplies in the form of LNG (as part of a kick-off meeting with Mitsui & Co. and IHI).

In addition, hydrogen filling station pilot project analyzes technical and commercial proposals from the foreign partners to supply equipment for hydrogen filling facilities.

Information disclosure

Information disclosure and environmental safety transparency is a keystone of the 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 and energy efficiency improvement of the Gazprom Group activities in tabs "Environment" and "Media". The tab "Investors" provides the Articles of Association and regulatory documents of PJSC Gazprom, data on the corporate governance, annual shareholders meetings, shares and dividends, creditor relations, and financial calendar. The "Information disclosure" tab encloses data on actual gas supplies for the EU, insider information on the wholesale energy market integrity and transparency (REMIT), annual, financial, environmental, sustainability reports, IFRS consolidated financial statements, quarterly issuer reporting, and other substantial facts.

Information on the current and future environmental and energy performance activities of Gazprom is constantly published in the monthly corporate Gazprom Magazine and scientific, technical and production Gas Industry Journal as well as four times a year in the science and technology digest Gas Science Bulletin (published by OOO Gazprom VNIIGAZ). Moreover, the Gazprom's Group subsidiaries publish newspapers and other periodicals, make TV and radio broadcasts.

Since 1995, PJSC Gazprom Environmental Report has been issued on an annual basis. Since 2010, Gazprom Group's Sustainable Report has been published on a regular basis as well. Its section "Responsibility for the well-being of our planet" provides detailed information on environmental protection and climate preservation, mitigation of the negative impact of business processes on natural resources, and cooperation with the interested parties.

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

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

The Gazprom Group management's commitment to information disclosure is confirmed by annual meetings with representatives of federal and regional mass media, who discuss rational use of natural resources, EP and energy saving. Gazprom monitors mass media to analyze public opinion on its environmental activities and further considers it for future planning and prompt managerial decision-making.

In 2021, there were 13,992 positive publications in mass media and Internet related to environmental aspects of the Gazprom Group activities.

Efficiency of corporate environmental policy is confirmed by independent experts.

Information disclosure under the CDP's global Climate and Water reporting system demonstrates the corporate GHG and water management strategies to the international community, financial institutions, and investors who take into account the score in the environmental impact management ranking when determining their investment portfolio policy. PJSC Gazprom has made 2021 year's B List in the Climate Change and Water Security Scores.

In 2021, PJSC Gazprom and three of its subsidiaries – OOO Gazprom transgaz Yekaterinburg, OOO Gazprom neftekhim Salavat, and OOO Gazprom dobycha Yamburg, made the top ten in the Environmental and Energy Efficiency Ranking of the 100 largest Russian companies of the environmental rating agency ERA (Interfax-ERA, ANO NERA).

Besides, PJSC Gazprom joined 2021 Groups A with the highest ranks on indices "Responsibility and transparency" and "Sustainable development vector" in sustainable development, corporate responsibility and reporting (ESG-indices) of the Russian Union of Industrialists and Entrepreneurs (RUIE). These ESG indices are included in reportingexchange.com, an international database of sustainability indices and rankings, and their estimation results serve as a basis for ESG stock indexes. The RUIE project includes two interrelated indices and interprets corporate social responsibility as company's responsibility for the impact of its decisions and activities on human society and the environment, including the economic, social and environmental aspects of such an impact.

Information disclosure ranking on the integration of the UN Sustainable Development Goals into the business of the Russian companies became an instrument for business quality assessment in sustainable development in addition to other RUIE indices. In 2021, PJSC Gazprom gained Level B in this ranking, and Sakhalin Energy – Level A.

PJSC Gazprom, Sakhalin Energy, and PJSC Gazprom Neft hit top ten of the Environmental Transparency Rating of Oil and Gas Companies Operating in Russia 2021 prepared by the Worldwide Wildlife Fund (WWF) of Russia and Creon Group. Analysis of the index participants was done by three main criteria: environmental management, extent of environmental impact and readiness to disclose information on environmental impact. This year PJSC Gazprom improved its performance by two positions.

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

PJSC Gazprom sponsors a number of cultural and environmental events.

For many years, PJSC Gazprom acts as a general sponsor of the All-Russian Nature Festival "Primordial Russia". In 2021, the VIII Festival attracted more than 74 thousand spectators, despite the restrictions that were imposed on all public events due to the difficult epidemiological situation. Europe's largest nature photography exhibition brought to the attention of the audience 34 thematic and author's expositions. The exhibition included 454 photos by 230 authors from 83 regions of Russia. Visitors to the festival for the first time had the opportunity to be acquainted with the works of the festival guests – wildlife photographers from the Republic of Finland.

The Festival program included more than 300 educational activities. The three-day Ecotourism Forum took place for the first time during the Festival. The Ministry of Natural Resources and Environment and the Federal Agency for Tourism of the Russian Federation were partners of this event. Balance between the nature and the man, specifics of tourism development in SPNAs, the impact of tourism on sustainable development of the Russian regions – these are just some of the topics that were discussed at the Forum.

Unique programs for the conservation of rare species and eco-tourism were presented by the Ministry of Natural Resources and Environment and the Federal Agency for Tourism of the Russian Federation, FSBI Information and Analytical Center for the Support of Reserve Management and Studies, the Russian Bird Conservation Union, the Ecocenter Reserved Areas, Protected Areas Embassy Foundation, Zoological Museum of the Moscow State University, and many other public and scientific organizations.

The Festival's movie program included 83 films about the pristine nature of Russia and its preservation.

Traditionally, "Primordial Russia" hosted the days of the Festival's partners – the Russian Geographical Society, the Vernadsky Non-Governmental Environmental Foundation, the TV channels "Live Planet" and the "Public Television of Russia".

The XX Baikal International Film Festival "People and Environment" n.a. V.Rasputin was held in Irkutsk on 8-12 September 2021. OOO Gazprom dobycha Irkutsk has been a permanent partner of the festival since 2012. The film forum is designed as a platform for reflection on the complex relationship between man and nature. Its goal is to raise environmental consciousness by means of movies. The five-day Festival's program included 140 events: 31 film shows, presentations, master classes, sessions and trainings. About 5 thousand people watched the films of competition and out-of-competition programs. The Festival was streamed over the Internet.

On 7–8 December 2021, OOO Gazprom VNIIGAZ hosted the VII International Scientific and Technical Conference "Environmental Safety in the Gas Industry" (ESGI-2021). The conference was held in a hybrid (online/offline) format. Combination of the traditional face-to-face meetings and online setups significantly increased the Conference's audience. The two-day event comprised over 60 scientific presentations. The total number of participants exceeded 250 people representing 123 companies from five countries. ESGI-2021 platform discussed environmental safety problems and solutions, energy saving and energy efficiency improvement, development prospects for biotechnologies and hydrogen economy.

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 part of 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.

The Group's companies make an invaluable contribution into international, Russian and local flora and fauna preservation programs in regions of their presence, provide charitable assistance to various environmental organizations, and annually participate in EP campaigns, scientific and educational expeditions.

In 2021, RUB 702.7 mln were spent on biodiversity and nature territories preservation, fisheries protection and reproduction.

Since 2020, OOO Gazprom transgaz Saint Petersburg has been supporting the Foundation "Friends of the Baltic Seal" engaged in conservation of rare marine mammal species, which include the Baltic and Ladoga ringed seals and the Baltic gray seal. Thanks to this initiative, new projects for the conservation of endangered animals have been launched: creation and installation of Russia's first system to protect pinnipeds from fishing gears; chemical and toxicological investigations of dead individuals to study the health of the pinniped population; aerial counting of the number of animals and ship-based observations of their habitats; a large-scale information and education campaign. In April, the foundation staff took two weakened grey seal cubs to the rehabilitation center, where they received treatment, grew stronger, gained weight and learned how to survive in the wild. In summer 2021, representatives of the Foundation "Friends of the Baltic Seal" and OOO Gazprom transgaz Saint-Petersburg released two grown-up gray seals into the Zheltaya Bay, Vyborg District, St. Petersburg.

Ornithofauna studies of the Yamal Peninsula continued at the Yamburg field. Their goal is to evaluate the number of birds and to monitor previously identified nesting places of the red-listed species. Ornithologists visited the nesting sites of the peregrine falcon, ringed 16 chicks, counted red-listed geese, and monitored the gyrfalcon's nest, which is the only nesting site of this rare falcon on the Yamburg field. The birds fearlessly settle near production facilities and breed.

In 2021, Gazprom's subsidiaries implemented significant number of environmental projects aimed at restoration of water biological resources.

In 2021, over 31.5 mln various fish species, including especially valuable species, were released.

OOO Gazprom transgaz Ukhta released 300 thousand whitefish juvenile into the Vychegda River in the Ust-Vymsky District of the Komi Republic. This campaign was attended by employees of the Northwest Territorial Administration of the Federal Fishery Agency of the Komi Republic, a branch of the FGBU Glavrybvod and employees of the fishing company BioResource. The event was carried out in accordance with recommendations of the territorial directorate of the Russian Federal Fisheries Agency as part of the overhaul repair of the underwater pipeline crossing operated by OOO Gazprom transgaz Ukhta.

The tenth release of chum salmon juvenile was organized with the support of OOO Gazprom dobycha shelf Yuzhno-Sakhalinsk. Over 33 million chum salmon juvenile have been released under this program over the years. In 2021, almost 170 thousand fish were released into the Tym River. The release of juvenile fish will have a positive effect on salmon numbers both in the Tym river, which is one of the most important and largest spawning areas on Sakhalin, and in the entire northeast of the island.

In the Mirny District of the Republic of Sakha (Yakutia) OOO Gazprom nedra released more than 41 thousand peled' fries into the Aannyaakh river, from where they will enter the Akhtaranda river and then the Vilyui water reservoir. The replenishment of commercial fish stocks in this reservoir is important for the human population with a traditional way of life.

OOO Gazprom transgaz Krasnodar released almost 30 thousand sterlet juvenile into the Protoka river. This campaign was held as part of the water bioresources reproduction program during the overhaul repair of the offshoot pipeline Maikop – Nevinnomyssk of the Zapadno-Voskresenskoye gas directorate.

OOO Gazprom transgaz Surgut together with the Nizhneobskiy Territorial Administration of the Federal Fishery Agency released about 700 thousand peled' juvenile into the Ob-Irtysh basin rivers.

The peled' is a valuable lake and river fish of the whitefish family. It was released into the basin to compensate damage that may have been caused during repair of the underwater gas pipeline crossings via the Tromjegan, Mokhovaya, Tavda, and Lokosovskaya rivers.

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

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.

Consideration of the indigenous minorities' interests and rights for traditional way of life and native habitat is a commitment made by the Company as part of its Environmental Policy. Thus, preserving the traditional lifestyle pattern of the indigenous peoples of the North is becoming one of the core principles in the development of the Yamal Peninsula fields.

The 2021 saw traditional reindeer herding through the industrial zone of the Bovanenkovo OGCF. Since the start of the seasonal migration, 7 thousand reindeer have crossed the territory of the Bovanenkovo field. One of the environmental tasks successfully solved by gas producers from Nadym is to create safe conditions for herding through the production areas. Protected reindeer herding through industrial areas was envisaged at the very beginning of the Bovanenkovo project. Today it allows for seasonal migrations to the Kara Sea and back.

As part of its activities on the continental shelf and in the Arctic zone of the Russian Federation, Gazprom guarantees compliance with environmental safety standards and requirements. In each region of the Company's presence, its subsidiaries develop and enforce action plans to preserve biodiversity in the Arctic zone of the Russian Federation.

In the reporting year, Gazprom continued active participation in implementation and financing of projects to identify and eliminate accumulated environmental damage sites in the Arctic zone.

The Company's employees have been cleaning the Kara Sea coast for three years. Over 1,350 m^3 of wastes and around 800 tons of scrap metals have been collected under the scope of environmental actions. OOO Gazprom dobycha Nadym crews started dismantling concrete slabs at an old airport and locator sites. There are plans to tidy up dozens of hectares and to clean the walrus rookery.

In August 2021, activists of the Clean Arctic project, a public initiative supported by PJSC Gazprom that brings together volunteers from all over the country, completed another environmental shift at Kharasavey. Volunteers from 10 regions of Russia cleaned up four sites on the coast of the Kara Sea where manual labor was necessary. They collected industrial and domestic waste for further disposal. In average, around 10 tons of scrap metals and 30 m^3 of conditionally inflammable materials: wood, plastic, rubber was collected per one site. Some of the garbage collected by volunteers was neutralized by thermal destruction at the sites of a specialized waste management operator. Scrap metal was sent for recycling to Arkhangelsk.

Comprehensive cleanup of the Kharasavey area will help the fragile Arctic ecosystem to get rid of the accumulated damage since the first geological exploration expeditions.

Moreover, the ecological expedition to the Vilkitsky Island organized by the Russian Center for Arctic Development with the financial support of OOO Gazprom dobycha Nadym and OOO Gazprom dobycha Urengoy was completed in August. Volunteers cleaned up about 4 hectares of the shoreline and the territory of the former military base. An environmental engineer from the Russian State Hydrometeorological University was involved in the environmental surveys to assess the anthropogenic impact on the ecosystem of the Vilkitsky Island. The engineer determined exact coordinates of pollution sites, took samples of soil and bottom sediments, conducted observations and made description of the natural environment. In the reporting year, environmental cleanup of the Vilkitsky Island entered its final phase. Elimination of accumulated damage began in 2017. During this period, volunteers collected and prepared for transportation about one thousand tons of garbage. Waste removal activities from the island are planned for the next year. After environmental cleanup, the Vilkitsky Island will return its undisturbed shape.

In 2021, the Gazprom Group companies continued charitable assistance to a number of socially significant environmental, social and cultural initiatives.

Thanks to cooperation of ANO Eurasian Center for the Conservation of Amur Leopards, ANO Center for the Study and Conservation of the Amur Tiger Population with PJSC Gazprom a series of nature conservation measures were carried out as part of a program to preserve the population of the Amur leopards and Amur tigers in Russia.

By tradition, PJSC Gazprom's subsidiaries participated in the International Memory Garden campaign in the cities of Nadym and Tolyatti, the settlement of Pangody, in Siberia and the Far East, in the Stavropolsky District and other localities and regions of the Russian Federation. The campaign was supported by the Federal Forestry Agency and the Ministry of Natural Resources and Environment of the Russian Federation. The All-Russian public movement "Volunteers of Victory" and the Victory Commander's Memorial Fund organized this event.

The year 2021 was declared the Year of Ecology in St. Petersburg. The Company supported the city's initiative and was actively introducing eco-habits into the daily lives, one of which was eco-volunteering. In July, OOO Gazprom transgaz Saint Petersburg in cooperation with the Friends of the Baltic Seal Foundation cleaned the coastal area of the Gulf of Finland near Kronstadt. The cubs of the Baltic gray seal that is included in the Red List of Threatened Species aka the Red Book of Russia, from time to time occur on the wild beach of the Kotlin Island. About 500 m of coastal area was cleaned from garbage resulting in collection of about four cubic meters of waste. In summer, employees of OOO Gazprom transgaz Saint Petersburg took part in an environmental tour around the Ladoga skerries. The event was aimed at preserving the ecosystem of the Ladoga islands and improving the environmental culture of the company's employees. The tour was partnered by the volunteer movement "Clean Vuoksa" and the Vernadsky Non-Governmental Environmental Foundation. During the two-day tour, 50 employees of the company were engaged in creating a hiking ecological trail and improving tourist sites on the territory of Ladoga skerries near the Kilpola Island in the Republic of Karelia.

By developing voluntary environmental responsibility mechanisms, PJSC Gazprom implements additional large-scale nature conservation measures in the regions of its presence, namely organization and participation in contests, workshops, environmental meetings, clean-up days, environmental campaigns. These arrangements are aimed at fostering of the ecological culture, education and awareness, and self-presentation of Gazprom as environmentally and socially responsible company.

In 2021, the Gazprom Group held 3,290 clean-up days. The Company's workers cleaned 2,820 sites (area over 7 thousand ha), planted over 450 thousand seedlings of trees and underwoods.

PJSC Gazprom and its subsidiaries participated as usual in the All-Russian Environmental Marathon "Green Spring" (April-May 2021) under the aegis of the Vernadsky Non-Governmental

Environmental Foundation and supported by PJSC Gazprom. The Company pays special attention to practical activities able to involve greater population in nature care. The Company's goal is to address strategic tasks of improving environmental situation and preserving Russia's natural heritage in accordance with PJSC Gazprom's Environmental Policy.

For the first time, the environmental cleanup day began simultaneously in two capitals – Moscow and St. Petersburg. In Moscow, the Green Spring opening ceremony was held at the Victory Museum on Poklonnaya Hill, and in St. Petersburg – at the Pioneer Garden. Families of the employees of PJSC Gazprom and its subsidiaries participated in landscaping, planting bushes and trees such as barberries, spruces, cedars, maples and oaks. Public organizations, citizens with a penchant for nature and favorable urban environment, and student volunteers joined the cleanup day.

The Vernadsky Non-Governmental Environmental Foundation and PJSC Gazprom have always paid serious attention to environmental education and awareness. In the reporting year, the cleanup day programs included creative master classes, scientific and practical activities focused on environmental education of the younger generation.

In 2021, over 800 thousand people from 77 constituent units of the Russian Federation, and the majority of PJSC Gazprom's subsidiaries participated in the marathon, which resulted in over 168 thousand trees and bushes planted, over 20 lakes, rivers, springs rehabilitated, more than 6 thousand ha of coastlands, forests and urban areas cleaned from garbage and landscaped, over 30 thousand m^3 of wastes recycled.

During the cleanup day, the employees of OOO Gazprom dobycha Astrakhan removed over 130 tons of household waste from 36 site structures and facilities to landfills, painted 12.5 km of curbs, cleaned 80 play and sport grounds, ditched, pruned, and whitewashed over 4 thousand trees.

OOO Gazprom transgaz Kazan team represented by more than 3,800 employees took part in the cleanup day using 64 units of equipment. Gas workers cleaned 12 ha area, liquidated phantom dumping on the Sedov street in Kazan, and removed about 15 tons of waste.

More than 1,500 employees of OOO Gazprom transgaz Volgograd branches took part in the environmental cleanup day aimed at preserving the nature of the native land. Joint efforts of the clean-up day participants helped to clean more than 137 ha of polluted areas, landscape green areas, plant flowers and more than 85 seedlings of linden, rowan, chestnut, sycamore, spruce and juniper trees. On the eve of the 9th of May, gas workers paid much attention to cleaning of the areas around memorial complexes and restoration of military glory monuments.

OOO Gazprom transgaz Tomsk took part in the All-Russia Cleanup Day and fulfilled 117 environmental initiatives, including cleaning of territories, planting of seedlings, organization of contests, lectures and excursions.

The workers of OOO Gazprom dobycha Krasnodar cleaned more than 5.5 km of coastlines of the Kuban and Pechora rivers as well as the Azov Sea shore from garbage, and upgraded the territory of the 30th Victory Anniversary Park in Krasnodar. The garbage collected on the park's shoreline was sorted and sent for disposal. The workers collected a total of 20.5 tons of waste and cleaned 27.3 ha. Together with representatives of the Shaposhnikov Caucasian State Natural Biosphere Reserve the company's employees cleaned the territory of the Priazovsky wildlife reserve.

More than 1,400 workers of OOO Gazprom transgaz Ukhta cleaned the territory with a total area of over 133 ha. The event took place in the Komi Republic, Arkhangelsk, Vologda and Yaroslavl regions. In Ukhta, seedlings of spruce, high cranberry, apple trees, as well as bushes of spiraea and snowberry were planted, in Vuktyl town 75 bird cherry, birch, rowan and spruce were planted; in Sheksna settlement – 2,850 flower seedlings.

OOO Gazprom transgaz Moscow employees held a major environmental event in the Peskov Voronezh State Nature Biosphere Reserve. Since 1985, it is included in the list of global biosphere reserves under UNESCO protection. Ecological landing party cleared the tourist trail in the arboretum from brushwood and dead wood.

Within the federal eco-marathon OOO Gazprom transgaz Stavropol employees cleaned over 70 ha of land from garbage within a month. Seven water bodies were rehabilitated in the course of the environmental campaign. Gas workers have restored over 50 monuments and memorials to soldiers of the Great Patriotic War. The company's employees also held a bicycle race, a series of lessons on energy saving, drawing and crafts contests in kindergartens, and prepared children to participate in a regional scientific and practical conference on ecology.

OOO Gazprom transgaz Saratov took part in the event to improve the territory of the Regional Center for Ecology, Local History and Tourism. The gas workers sawed down and transported about 20 tons of dry and weedy trees to the landfill. The Center is 4.2 ha in area with more than one thousand species of trees, bushes, herbs typical for different natural and climatic zones of the world. Collection-exhibition «Russian forest» is a source of seeds and plants for schools and other educational organizations of Saratov and the Saratov region as well as for repatriation of rare plant specimens to natural habitats.

OOO Gazprom transgaz Ekaterinburg took active part in landscaping. The main works on the preservation and renewal of the forest reserves took place in the Trans-Urals. The workers planted 4 thousand pine seedlings in the neighborhood of the district center, laid an oak alley in the botanical garden of the Ural Federal University named after the first President of Russia Boris N. Yeltsin. The garden contains 177 species of rare, endangered and intensely extirpated plants.

In the first half of 2021, OOO Gazprom dobycha Orenburg carried out 65 activities as part of the Biodiversity Conservation Program resulting in over 4.2 ha of natural sites cleaned, about 70 birdhouses and bird feeders installed, around 400 trees and bushes planted, and over 250 flower beds created. The company held arts and crafts contests on biodiversity conservation for the employees' children and students of educational institutions, and biodiversity conservation seminars for the company's personnel.

OOO Gazprom dobycha Orenburg held an environmental campaign to clean the shoreline of Lake Beluzhye from garbage.

OOO Gazprom dobycha Orenburg has been restoring springs in the Orenburg region since 2013. This year, as part of the «Live spring!» contest, the company's employees restored and improved a spring near the village of Radovoka in the

Perevolotsk district, and the spring Klyuch Vetlyanki near the village of Chuloshnikov in the Orenburg district. A staircase with a railing down to the spring, benches and a garden house were installed. A site for drinking and water drawing was organized near the spring. Laboratory tests have confirmed that the spring's water is of good quality.

OOO Gazprom dobycha Noyabrsk held a three-day marathon to clean the coastal area and the bed of Lake Svetloye together with the members of the local Diving Federation "White Bear" as part of the "Clean City" campaign.

More than 530 employees of OOO Gazprom transgaz Ukhta joined the All-Russian River Ribbon campaign aimed at cleaning the banks of water bodies - traditionally popular recreation areas, and improving the environmental culture of the population. The length of the banks and the adjacent water area cleaned within 2.5 months exceeded 26.8 km. Cleaned area totaled 148.28 ha. The River Ribbon campaign was also supported in the Komi Republic with 17 km cleaned coastal lines, and 794 bags of garbage collected. More than 10 km of coastal lines were cleaned in the Arkhangelsk, Vologda and Yaroslavl regions. Recreational areas along rivers in the Vologda region were also cleared up.

Ecological trail "Lakes Paraskin" was opened in the town of Ukhta. The landscaping project is timed to coincide with the 100th anniversary of the Komi Republic, which the region celebrated in 2021. Lakes Paraskin is a unique karst landscape in the south of the Ukhta region of the Komi Republic. There are more than 20 lakes adjacent to the specially protected area, the maximum depth of which is 22 meters. The Decree of the Government of the Russian Federation on creation of the state nature sanctuary of the federal significance "Lakes Paraskin" with an area of 17.1 thousand ha entered into force in August 2021. The sanctuary will be a branch of the Pechora-Ilych State Nature Biosphere Reserve. The creation of the reserve and the eco-trails is the result of a joint work of the Ministry of Natural Resources of Russia, the Ministry of Natural Resources of the Komi Republic and OOO Gazprom transgaz Ukhta – one of the largest companies in the region. An ecological trail, a parking lot for motor vehicles, information boards for the recreational area, wooden sculptures, an entrance arch, swings, benches, a suspension bridge, and garden houses for visitors were installed. The length of the ecological trail today is 950 meters.

Upon an initiative of the UN's Economic and Social Council, and in honor of the fifth anniversary of the Peace and End-of-War Declaration, Moscow planted trees to strengthen peace between nations, unite people, protect the environment and promote a culture of peace at the national level as part of the global Trees for Peace campaign.

Glossary of main terms and acronyms

Name	Definition
AGCCS	Automated gas contamination control station
Associated petroleum gas (APG)	Mixture of gases and vaporous hydrocarbon and non-hydrocarbon components emitted from oil wells and non-hydrocarbon components emitted from oil wells and ol-in-place during separation
BAT	Best available technique
Biodiversity (biological diversity)	The whole variety of living forms of different habitats, including onshore, offshore, and other water ecosystems and their constituent eco complexes
C&L	Combustibles and lubricants
CDP	CDP is a not-for-profit charity that runs the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts
CHPP	Combined heat and power plant
CR	Compressor room
cryo-FS	Cryogenic filling station
CS	Compressor station
EMS	Environmental 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
EnMS	Energy Management System
Environment	Set of nature components, natural and anthropogenic as well as man-made objects
Environment quality	State of the environment characterized by physical, chemical, biologival, and other values and (or) their combination
Environmental audit	Independent comprehensive documented assessment of compliance of business and other activities with environmental requirements, including standards and regulatory documents, international standards, and drawing up recommendations to improve such activities
Environmental damage	Negative change in the environment caused by pollution, which entailed degradation of natural ecosystems and depletion of natural resources
Environmental impact assessment	Type of activity aimed at identificaion, analysis and accounting of direct, indirect and other consequences of the impact on the environment from planned business and other activities to make a decision on possibility or impossibility of their execution
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 the stateof the environment, assesment and forcast of environmental conditions changes ander the impact of natural and anthropogenic factors
Environmental protection (EP)	Actions aimed at conservation and recovery of the environment, rational use and reproduction of natural resources, prevention of negative environmental impact of business and other activities, and mitigation of consequences
Environmental protection requirments	Obligatory conditions, restrictions or their combination apllicable to business and other activities stipulated by environmenta laws, statutes, environmental standarts, federal norms and rules as well as other environmental regulatory documents
Environmental review	Ensuring compliance of documents and/or documentation that justify planned business and other activities according to implementation of environmental review object with environmental requirements, established by environmental technical regulations and legislation, in order to prevent the negative impact of such activities on the environment
Environmental safety	State of 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

Name	Definition
Environmental supervision	System of measures aimed at prevention, identification and restraint of environmental legislative violations, ensuring compliance of business and other activities with environmental requirements, including standards and regulatory documents
ESG	Environmental, Social, and Governance
EU	European Union
FEC	Fuel and energy complex
FER	Fuel and energy resources
GCF	Natural gas and condensate field
GCU	Gas compressor unit
GDS	Gas distribution station
GF	Natural gas field
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 (CO_2)
Global warming potential (GWP)	An index measuring the radiative forcing following an emission of a unit mass of a given substance, accumulated over a chosen time horizon, relative to that of the reference substance, carbon dioxide (CO_2)
GMF	Gas motor fuel
GPP	Gas processing plant
Greenhouse gases (GHG)	Gases that presumably cause greenhouse effect globally. The main greenhouse gases in order of their estimated contribution into the Earth's heat balance are water steam, carbon dioxode, methane, ozone, sulphurylfluoride, halocarbons, and nitrogen oxide
GTL	Gas trunkline
GTU	Gas turbine unit
HPP	Hydroelectric power plant
IPCC	Intergovernmental Panel on Climate Change
ISO 14001:2015	Environmental management systems – Requirements with guidance for use
ISO 50001:2018	Energy management systems – Requirements with guidance for use
IUCN	International Union for Conservation of Nature
LNG	Liquefied natural gas
LPD	Linear production department
LS	Linear section
MCS	Mobile compressor station
MEL	Mobile eco-laboratory
MGFS	Mobile gas filling station
MLF	Module laboratory facility
Natural complex	Set of natural objects functionally and natively related to each other, and united by geographical and other corresponding features.
Natural object	Natural ecosystem, natural landscape, and their constituent elements that preserve their natural features
Nature resources	Nature components, natural bjects, and nature and anthrpogenic 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

Name	Definition
Negative environmental impact	Impact of economic and other activities, which consequences lead to adverse changes in the environment quality
NGLF	Natural gas liquefaction facility
NGV	Natural gas vehicle
OEC	Opperational environmental control
OEM	Operational environmental monitoring
OGCF	Oil, natural gas and condensate field
OR	Oil refinery
Pollutant	Substance or mixture of stubstances that occur in amounts and (or) concentrations exeeding specified limits for chemicals, including radioactive and other substances, and microorganisms, and affect the environment in negative ways
R&D	Research and development
RES	Renewable energy sources
RUIE	Russian Union of Industrialists and Entrepreneurs
SES	Secondary energy sources
Specially protected natural area (SPNA)	Land, water and air zones with natural complexes and objects having special nature protection, scientific, cultural, esthetic, recreational andwellness significance with exclusive security arrangemnents, totally or partially removed from the economic use by the decision of state bodies. SPNAs are national heritage
SPP	Solar power plant
TCFD	Task Force on Climate-related Financial Disclosures
Transition Pathway Initiative (TPI)	The Transition Pathway Initiative is a global, asset-owner led initiative which assesses companies' preparedness for the transition to a low carbon economy
UAV	Unmanned aerial vehicle
UGS	Undergroud gas storage
UGSS	Unified Gas Supply System
UN	Unated Nations
Waste management	Activities on collection, accumulation, transportation, processing, recovery, treatment, disposal of waste
WGWAP	Western Gray Whale Advisory Panel

Russian Business and Other Organizations

Name	Definition
ANO	Autonomous Non-Commercial Organization
AO	Joint Stock Company
FSBI	Federal State Budgetary Institution
OAO	Open Joint Stock Company
OOO	Limited Liability Company
PAO	Public Joint Stock Company
ZAO	Closed Joint Stock Company

Units of Measurements

Unit	Definition
bcm	billion cubic meters
bln	billion
c.e.	coal equivalent
g	gram
Gcal	billion calories
GJ	billion joule
GW	billion watt
ha	hectare (ten thousand square meters)
hr	hour
kg	kilogram
kW	thousand watts
m^3	cubic meter
mg	milligram
MJ	megajoule
mln	million
MW	million watts
ncm	cubic nanometer
t	ton
toe	ton of oil equivalent
W	watt
Wh	watt-hour

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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 2021

To the Shareholders and 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 and its subsidiaries (hereinafter – PJSC Gazprom) (production, transmission, processing and underground gas storage) and other indirect greenhouse gas emissions of Gazprom Group for 2021 (hereinafter – the information on GHG emissions) in the attached Gazprom Environmental Report 2021 (hereinafter – the Report).

As a result of the engagement, we report in a form of a limited assurance conclusion on whether the Management’s Statement that the information on GHG emissions is prepared in accordance with the applicable criteria (set out below in section “Applicable Criteria” of this report) and is free from material misstatement is, in all material respects, fairly stated.

Our conclusion applies only to the information on GHG emissions that is presented in the section "Management Statement" of this report and included in the Report in the section "Greenhouse gas emissions" in the tables: “GHG emissions dynamics at PJSC Gazprom by types of activities, 2017–2021, mln tons of CO_2e“, “Dynamics of methane emissions by types of PJSC Gazprom activities, 2017-2021, thousand tons“, “Indirect energy GHG emissions at PJSC Gazprom by types of main activities (Scope 2), 2021, mln tons of CO_2e“, “GHG emissions due to the use of products sold by the Gazprom Group (Scope 3), 2021, mln tons of CO_2e“. Our conclusion does not extend 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, identifying of and complying with laws and regulations applicable to PJSC Gazprom, making judgements and estimates that are reasonable in the circumstances, maintaining adequate records in relation to the information on GHG emissions.

Our Responsibilities

Our responsibility is to express a conclusion on the Management's Statement in relation to 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 accordance with the applicable criteria (set out in the "Applicable Criteria" section of this report) and is free from material misstatement, is fairly stated in all material respects.

Our Independence and Quality Control

We have complied with the independence and ethical requirements established by the Russian *Rules on Independence of Auditors and Audit Firms* and the *Code of Professional Ethics for Auditors* and by the *International Code of Ethics for Professional Accountants (including International Independence Standards)* issued by the International Ethics Standards Board for 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, 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.

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 developed based on the risk assessment were based on our professional judgement and 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 responsible employees of PJSC Gazprom and Gazprom Group 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,
- 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 and recommendations to the GHG emission quantification and reporting, as well as reference information contained in the following documents:

- Order of the Ministry of Natural Resources and Ecology of the Russian Federation No. 300 dated June 30, 2015 "On Approval of Methodological Guidelines and Guidelines for Quantifying Greenhouse Gas Emissions by Organizations Engaged in Economic and Other Activities in the Russian Federation, approved by Order of the Ministry of Natural Resources and Ecology of the Russian Federation"[1],

[1] http://docs.cntd.ru/document/420287801

– Order of the Ministry of Natural Resources and Ecology of the Russian Federation No. 330 dated June 29, 2017 "On approval of methodological guidelines for the quantitative determination of the volume of indirect energy emissions of greenhouse gases" [2],

– CDP Technical Note: Guidance methodology for estimation of scope 3 category 11 emissions for oil and gas companies[3].

Management's Statement

Management states that the following information on GHG emissions for the year 2021 presented in the Report in the section "Greenhouse gas emissions" in the tables: "GHG emissions dynamics at PJSC Gazprom by types of activities, 2017–2021, mln tons of CO_2e", "Dynamics of methane emissions by types of PJSC Gazprom activities, 2017-2021, thousand tons", "Indirect energy GHG emissions at PJSC Gazprom by types of main activities (Scope 2), 2021, mln tons of CO_2e", "GHG emissions due to the use of products sold by the Gazprom Group (Scope 3), 2021, mln tons of CO_2e":

- information on direct GHG emissions (Scope 1) for 2021 ("GHG emissions dynamics at PJSC Gazprom by types of activities, 2017–2021, mln tons of CO_2e"):
  - production **17.95** mln tons of CO_2e
  - transmission **93.09** mln tons of CO_2e
  - underground gas storage **1.66** mln tons of CO_2e
  - processing **5.90** mln tons of CO_2e
- information on direct methane emissions (Scope 1) for 2021 ("Dynamics of methane emissions by types of PJSC Gazprom activities, 2017-2021, thousand tons*"):
  - production **59.84** thousand tons
  - transmission **897.34** thousand tons
  - processing **1.10** thousand tons
  - underground gas storage **19.98** thousand tons
- information on indirect energy GHG emissions (Scope 2) ("Indirect energy GHG emissions at PJSC Gazprom by types of main activities (Scope 2), 2021, mln tons of CO_2e"):
  - production **0.35** mln tons of CO_2e
  - transmission **2.47** mln tons of CO_2e
  - processing **1.83** mln tons of CO_2e
  - underground gas storage **0.05** mln tons of CO_2e

[2] http://docs.cntd.ru/document/456079014

[3] https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/000/469/original/CDP-Scope-3-Category11-Guidance-Oil-Gas.pdf?1479754082

- information on other indirect GHG emissions (Scope 3) ("GHG emissions due to the use of products sold by the Gazprom Group (Scope 3), 2021, mln tons of CO_2e"):
  - natural gas **932.48** mln tons of CO_2e
  - oil and gas condensate **77.94** mln tons of CO_2e
  - other energy resources **140.33** mln tons of CO_2e
  - total: **1,150.75** mln tons of CO_2e

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

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 accordance with the applicable criteria (set out in the "Applicable Criteria" section of this report) and is free from material misstatement, is not, in all material respects, fairly stated.

Restriction of Use of Our Report

Our limited assurance report relating to the information on GHG emissions has been prepared for the Shareholders and the Management of PJSC Gazprom 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.

Kolyadko Elena Genrikhovna

Director JSC "KPMG"

Moscow, Russia

24 May 2022

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