

Key information on Climate Change mitigation for Transneft Group

Impact of Climate Change Risks on Transneft Operations

Transneft acknowledges the importance of considering the risks associated with climate change,¹ including:

- global risks associated with climate change issues;
- risks of permafrost thaw and negative impact on Transneft's operating facilities;
- risks of declining crude oil demand in the long term (energy transition risk).

Transneft assesses the impact of climate risks on the Company's activities ², and analyzes the risks and opportunities associated with climate change.

Impact of Climate Risks on Transneft Operations

Positive factors	Negative factors
<p>1. Reducing specific energy costs as well as the cost of oil and petroleum products transportation. In particular, with an increase in the ambient temperature (and/or oil coming from suppliers), the viscosity of the transported oil decreases and, accordingly, the hydraulic resistance of oil pipelines also decreases, which in turn leads to a decrease in cost per unit of energy resources and the unit cost of electrical energy/energy resources consumption for oil transportation both in the Arctic and beyond.</p>	<p>1. Risks of a long-term decrease in oil and petroleum products demand; Efforts underway to reduce carbon dioxide emissions and the climate change response can reduce the dynamics of the demand for oil and petroleum products in the medium and long term.</p>
<p>2. Reduction of oil heating costs. At the same time, energy consumption for heating oil to a predetermined temperature is reduced, both to reduce oil viscosity and to ensure the necessary safe shutdown time during scheduled and emergency shutdowns of oil pumping.</p>	<p>2. Risks to operating facilities due to permafrost melting. Rising ambient temperatures could cause risks of permafrost melting, which could create potential danger to the Company's operating facilities located on permafrost soils in permafrost zone.</p>

¹ For recognition of climate change, see also the Sustainability Development Report for 2020 (p. 15).

² To obtain a quantitative effect for the period up to 2025, it is necessary to carry out calculations as part of the corresponding research.

Positive factors	Negative factors
<p>3. Cutting down heating costs. As the average ambient temperature rises, heating costs for production facilities also decrease.</p>	<p>3. Decrease of investors' interest in companies of oil and gas sector and related industries. Increased consideration of sustainability factors in investment decisions could reduce investor interest in investing in financial instruments of companies in the oil and gas sector and related sectors</p>
	<p>4. Increased spending on combating climate change. Increased spending on combating climate change, including due to the possible introduction of a carbon tax.</p>

Risk of Permafrost Thaw

The vast majority of Transneft's assets are outside the continuous permafrost zones. 13 facilities of Transneft Group are located on the territory of the Arctic of the Russian Federation: 11 facilities of Transneft Siberia (5 PSs, 1,183 km of the OTP L/Line³) and 2 facilities of Transneft North (1 PS, 69 km of OTP L/Line):

The Urengoy OTPD of Transneft Siberia:

- The Zapolyarye – Purpe PS oil pipeline (0–415.3 km);
- The IPS No. 1 pump station site and PS No. 2;

The Noyabrsk OTPD of Transneft Siberia:

- Tarasovskoe – Muravlenkovskoe oil pipeline (0–163 km), the section from 108 to 163 km has been decommissioned;
- The Kholmogory – Klin oil pipeline (0–95.7 km);
- The Urengoy – Kholmogory oil pipeline (274–503 km);
- The Purpe – Samotlor oil pipeline (0–266.3 km);
- The Zapolyarye – Purpe PS oil pipeline (415.5–483.9 km);
- The Kholmogory PS, the Purpe PS and the Vyangapur PS pump station sites;

The Usinsk RPD of Transneft North:

- The Usa – Ukhta oil pipeline (0–69.04 km);
- The Usa PS pump station site.

For the purpose of systematic monitoring, measurement and control of trunk pipeline (TP) facilities parameters in combination with physical and geographical conditions, climatic and geological processes in its environment, with the subsequent calculation of performance indicators and operational safety, development of proposals for compensating measures, a monitoring system for TP facilities located in the permafrost soil areas has been introduced.

³PS – oil pumping station, L/Line - line of the oil trunk pipeline

The following facilities are subject to monitoring in the Arctic:

- oil trunk pipelines with a total length of 1,252 km (including 317 km of aboveground, 935 km of underground), of which 311 km are in the permafrost soil area, 36 km are in the area of exogenous geologic processes;
- 6 onsite facilities (including 2 facilities located in the permafrost area);
- 73 tanks (including 18 tanks located in the permafrost area).

Monitoring is carried out on the basis of the results of field surveys, air and surface laser scanning, in-line inspection and includes monitoring the state of foundations, the state of permafrost soils, geological processes, geometry and stress-strain state of pipelines and its fittings.

The procedure and scope of monitoring work has been generally determined and carried out in accordance with the design documentation, industry regulatory and ruling documents of the Company and the monitoring programme approved by Transneft.

In accordance with the monitoring programme approved by Transneft for TP facilities located in the permafrost soil area, the following is carried out:

at the OTP, the control of:

- the position of pipelines using 798 height determination devices;
- the position of 19,245 oil pipeline supports;
- the positions of 187 stop valve units and 31 pipeline clean-up and inspection tools traps;
- the positions of 2,885 overhead power transmission line supports;
- the soil temperature for 4,419 thermometric wells;
- the operability of 99,085 soil thermal stabilisers;
- the dynamics of boundaries changes of 181 sections (36 km) with exogenous geological processes.

at onsite facilities, the control of:

- the positions of 73 tanks;
- the positions of 1,452 PS facilities;
- the soil temperature for 828 thermometric wells;
- the operability of 25,923 soil thermal stabilisers;

The following deviations were identified based on the monitoring results and the following measures were taken:

at the OTP:

- 561 thermometric wells with non-design soil temperature for which, according to the results of engineering surveys, additional arrangement of 11,683 soil thermal stabilisers and 246 thermometric wells was carried out. According to the results of the performed compensating measures, the soil temperature mode corresponds to the design values;

- 82 inoperative soil thermal stabilisers for which replacement with efficient soil thermal stabilisers was performed.

at onsite facilities:

- 87 inoperative soil thermal stabilisers for which replacement with efficient soil thermal stabilisers was performed.

Key Measures to Combat Climate Change

The key measures to combat climate change processes are aimed at improving energy efficiency and managing greenhouse gas emissions:

- ✓ Transneft has developed, approved and consistently implements the Energy Saving and Energy Efficiency Enhancement Programme to save energy resources. In accordance with the Programme, measures are being taken to reduce the volume of greenhouse gas emissions. Its target indicator is reduced consumption of energy resources (gas, thermal and electrical energy, fuels and lubricants) used for internal consumption and process needs when providing services related to oil and petroleum products transportation via trunk pipelines. Under comparable conditions, the specific electricity consumption for oil transportation decreased by 14.5% from 2010 to 2020 and by 17.8% for petroleum product transportation.
- ✓ Since the bulk of greenhouse gas emissions from Transneft's operating facilities is generated as a result of stationary combustion of fuel in boiler houses, carried out to generate heat for their own needs, the equipment used for this purpose has the most modern design, which ensures minimum fuel consumption, high efficiency (more than 94%) and, as a result, minimal CO₂ emissions.

The Company's energy management system is certified according to the standards ISO 50001:2018, energy audits are conducted annually. As part of Transneft's works to improve energy efficiency, an annual independent audit of oil and petroleum products transportation electricity consumption data, as well as for the main types of energy carriers, is carried out during the audit of the Long-Term Development Programme. KPMG acted as the auditor of the 2020 Long-Term Development Programme.

The Company's environmental management system is certified according to the standard ISO 14001:2015.

Research and Development (R&D) on ways to reduce/neutralise greenhouse gas emissions into the atmosphere at oil and petroleum products transportation and storage facilities.

As part of the ongoing R&D detailed studies of the risks and opportunities associated with climate change will be included, as well as the development of a long-term strategy for managing greenhouse gas emissions.

The planned value of financial expenditures aimed at combating climate change (including the energy efficiency programme implementation) at the end of 2020 was RUB 0.8 billion. Estimated investment in climate change R&D in 2020 amounted to RUB 4.8 million.

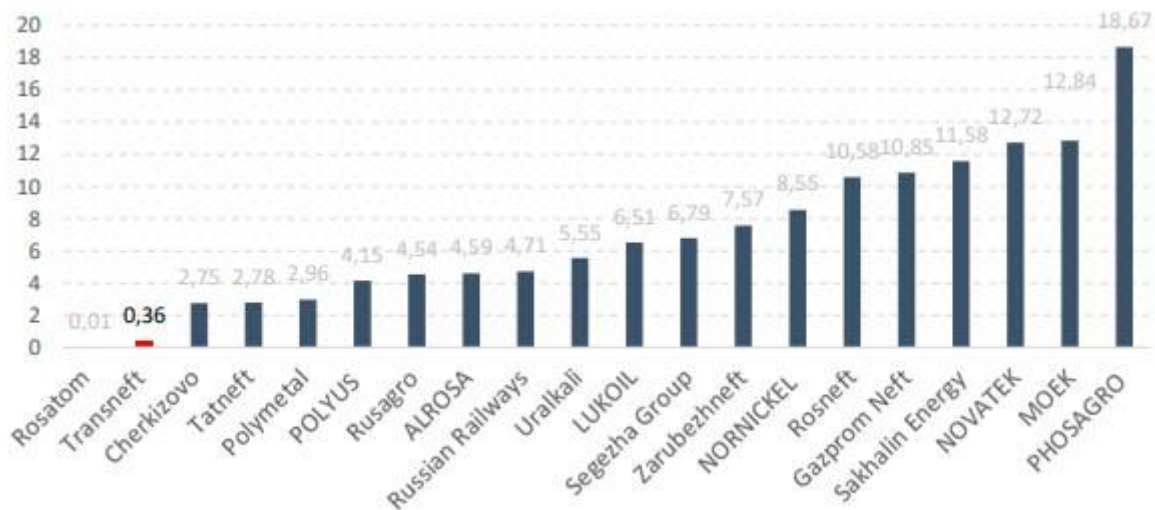
Reduction of Greenhouse Gas Emissions

Transneft is one of the largest transport companies in Russia and worldwide in terms of transportation volumes and cargo turnover.

At the same time, Transneft is also one of the leaders among Russia's biggest companies in terms of minimum greenhouse gas emissions in relation to revenue.

In December 2021, Transneft was ranked 2nd (out of 37 companies) in the minimum carbon footprint of Russia's biggest companies rating, compiled by the AK&M rating agency. Specific greenhouse gas emissions amounted to 0.36 tonnes per RUB 1 million of revenue. At the same time, emissions as a share of revenues fell by 11.7% compared to 2019. ⁴

Ratio of greenhouse gas emissions to revenue under IFRS, 2020 (tonnes/RUB million)



The main trend in the decarbonisation of transportation companies worldwide is electrification.

The level of electrification of the Transneft's production activities is over 85% (share of electrical energy in total energy consumption). At the same time:

- ✓ Transneft is among the world leaders in terms of the lowest specific electrical energy consumption in oil transportation.
- ✓ Consistently implements a programme to increase energy efficiency;
- ✓ Provides the most energy-efficient way of land oil and petroleum products transportation (pipeline transport);

⁴ References: 1) <https://www.transneft.ru/news/view/id/37771>
2) https://akmrating.ru/rejting_uglerodnogo_sleda/

- ✓ The total share of electrical energy purchases with a low carbon component (NPPs, HEPs, renewable sources) is estimated at about 40%.

Actual data on the dynamics of greenhouse gas emissions indicate a consistent decline. In 2016 and 2020, greenhouse gas emissions were reduced by 40%, from 566,100 to 342,200 tonnes.⁵

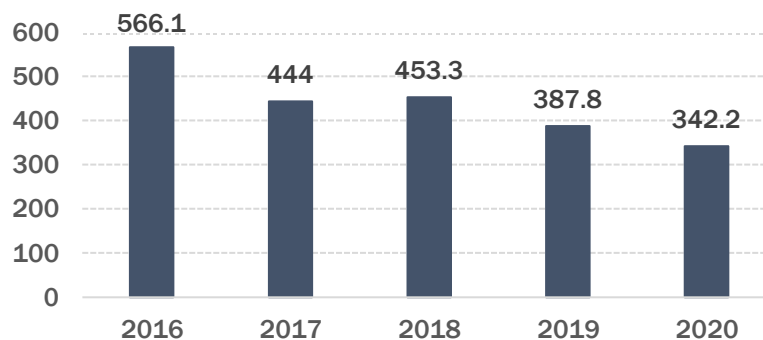
Most of Transneft Group's greenhouse gas emissions come from carbon dioxide emissions.

Emissions of other greenhouse gases, such as methane (CH₄) and sulfur hexafluoride (SF₆), account for less than 5% of total greenhouse gas emissions in (CO₂ equivalent).

Methane emissions decreased from 1,739 tonnes in 2017 to 569 tonnes in 2018, to 184 tonnes in 2019 and 177 tonnes in 2020.

The 2020 emissions of sulfur hexafluoride are less than 1% of total greenhouse gas emissions in (CO₂) equivalent.

Dynamics of Transneft's Greenhouse Gas Emissions, thousand tonnes



Due to the high share of production activities electrification in Transneft, greenhouse gas emissions (by scope 1) are mainly from boiler house equipment.

At the same time, due to the full electrification of Transneft's main production activity for transporting oil and petroleum products, direct greenhouse gas emissions depend primarily on the implementation of the boiler house equipment upgrading programme and the average ambient temperature during the heating season and are virtually independent of transportation volumes.

The use of fossil fuels for heat generation at local boiler houses is caused by the fact that the efficiency of heat generation at such boiler houses significantly exceeds the average specific efficiency of electrical energy generation at Russian power plants. In other words, with the exception of certain regions of the Russian Federation with a pronounced predominance of hydroelectric power plants in the structure of generating capacity, electric heating is not an energy-efficient heating method, as it requires 2-4 times more primary fuel to produce the required amount of heat.

⁵ https://www.transneft.ru/u/section_file/55751/transneft_environmental_presentation-eng.pdf (page 9)

Comparison of planned and actual indicators for the main source of CO₂ emissions (boiler house equipment emissions) indicates that the actual CO₂ emissions are regularly lower than the planned levels due to the implementation of the boiler house equipment upgrading programme.

In addition to the high level of electrification of production activities, Transneft's large scale of operations and the energy efficiency of the equipment used also contribute to lower specific energy consumption and greenhouse gas emissions.

The Company currently calculates greenhouse gas emissions under scope 1 (emissions from the Company's own or controlled sources). Work is underway on the transition to the calculation and management of indirect greenhouse gas emissions (for scope 2 and 3).

Transneft is conducting research and development work to adapt approved methodologies for calculating greenhouse gas emissions and to develop recommendations for the application of greenhouse gas emission reduction/neutralisation techniques, which will include additional consideration of risks and opportunities associated with climate change processes. A long-term strategy for managing greenhouse gas emissions is planned.

Based on the results of the work performed, quantitative targets for reducing greenhouse gas emissions will be established by mid-2022.

Indicators of Greenhouse Gas Emissions Intensity.

In terms of economic indicators of greenhouse gas emission intensity, the Company is among the leaders in the minimum amount of emissions per unit of revenue in the Russian Federation.

In December 2021, Transneft was ranked 2nd (out of 37 companies) in the minimum carbon footprint of Russia's biggest companies rating, compiled by the AK&M rating agency. Specific greenhouse gas emissions amounted to 0.36 tonnes per RUB 1 million of revenue under IFRS. At the same time, emissions as a share of revenues fell by 11.7% compared to 2019.⁶

The ratio of greenhouse gas emissions to key operational indicators also shows a consistent decline.

Ratio of Transneft's greenhouse gas emissions to revenue, transportation and freight turnover

Indicator	UoM	2017	2018	2019	2020	Read more:
Greenhouse emissions	tonnes	444,100	453,300	387,700	342,200	1) Sustainable Development Report (SDR) 2020 ⁷ , p. 169 2) SDR 2019 ⁸ , p. 122

⁶ References: 1) <https://www.transneft.ru/news/view/id/37771>
2) https://akmrating.ru/rejting_uglerodnogo_sleda/

⁷ https://www.transneft.ru/u/section_file/57211/transneft_oyr-2020-en_06.08.pdf (in English)

⁸ https://www.transneft.ru/u/section_file/48801/verstka_oyr_angl_dlya_saita.pdf (in English)

Indicator	UoM	2017	2018	2019	2020	Read more:
Revenue under IFRS	RUB million	884,337	979,958	1,063,829	962,440	
Ratio of greenhouse gas emissions to revenue volume	tonnes/RUB million.	0.502	0.463	0.364	0.356	
Transportation volume (oil + petroleum products)	million tonnes	510.6 (477.5+33.1)	519.0 (480.0+39.2)	522.8 (485.0+37.8)	480.0 (442.2+37.8)	1) SDR 2020, p. 46 2) SDR 2019, p. 38
Ratio of greenhouse gas emissions to the transportation of oil and petroleum products volume ⁹	tonnes/million tonnes	869.6	873.4	741.6	712.9	
Turnover (oil + petroleum products)	billion tkm	1,258.0 (1,211.2+46.8)	1,270.1 (1,217.4+52.7)	1,297.4 (1,247.6+49.8)	1,183.1 (1,132.2+50.9)	1) SDR 2020, p. 49 2) SDR 2019, p. 41
Ratio of greenhouse gas emissions to oil and petroleum products freight turnover turnover ¹⁰	t/billion tkm	353.0	356.9	298.8	289.2	

In 2020, the ratio of greenhouse gas emissions to the volume of oil and petroleum products transportation decreased to the lowest values - 712.9 tonnes/million tonnes (minus 20.5% compared to 2017).

Key Targets for Greenhouse Gas Emissions

Transneft sets the following key targets for medium- and long-term greenhouse gas emission trends¹¹:

- reduction of greenhouse gas emissions as part of an energy saving programme;
- setting medium- and long-term quantitative targets for greenhouse gas emissions;
- development of the long-term strategy for managing greenhouse gas emissions;
- calculation and management of indirect greenhouse gas emissions.

The potential for reducing greenhouse gas emissions is limited by the already achieved full electrification of the main production activities and the high level of energy efficiency of the boiler house equipment used.

⁹ The indicator reflects the Group's emissions per unit of transported products to assess their value in the overall supply chain of products from production to delivery to the end consumer. There is no separation of emissions by individual types of transported products due to the use of common infrastructure for pumping oil and petroleum products on parallel sections of oil and petroleum products pipelines. Due to differences in the length and breadth of the transportation network, the indicator is not applicable for comparison between different transportation companies.

¹⁰ The indicator is calculated for comparison between different transportation companies. Not applicable to estimating the contribution to total emissions per unit transported, as the average transport haul distance of the system is not considered.

¹¹ https://www.transneft.ru/u/section_file/55751/transneft_environmental_presentation-eng.pdf (p. 17)

Total greenhouse gas emissions from boiler house equipment, which accounts for most of the Company's greenhouse gas emissions, are expected to decline by 2.5% from 2021 levels by 2026.

Transneft is currently conducting research and development work to adapt approved methodologies for calculating greenhouse gas emissions and to develop recommendations for the application of greenhouse gas emission reduction/neutralisation techniques, which will include additional consideration of risks and opportunities associated with climate change processes.

A long-term strategy for managing greenhouse gas emissions is planned.

As regards the results of the work performed, quantitative targets for reducing greenhouse gas emissions for the Company as a whole will be established by mid-2022.