Climate-related risks

For more details on Nornickel's climate-related risks and opportunities, please see our Climate Change Report.

Nornickel assesses climate-related risks and opportunities based on the Bank of Russia's recommendations for public joint stock companies to disclose non-financial information[1] as well as TCFD recommendations, which prioritise the following risk categories:

- **Physical risks.** Can manifest themselves as extreme weather events (acute) or longer-term shifts in climate patterns (chronic). Consequences of climate-related physical risks for the Company can include permafrost thawing, changes in water levels in water bodies, precipitation amounts and patterns, and other climate risk factors that may have a significant adverse impact on the Group's operations
- **Transition risks.** Arise from the global transition to a low-carbon economy. Key risks of this type include relevant political, regulatory, technological, market, and reputational risks that can substantially affect demand for Nornickel products

The Company's assets are located in regions that have long been affected by climate change, which is reflected in our current technical, production, and environmental risks.

The Company continues integrating its climate risk and climate-related risk factor management process into its business processes in accordance with TCFD and COSO recommendations. The continued integration of physical risks implies structuring the procedure and rules around managing both current and longer-term risks. Transition risks can be classified in line with TCFD recommendations both as a standalone risk and as a risk factor for other risks. The Company has compiled a list of its transition risks and ran their pilot assessment.

As part of implementing the TCFD Compliance Roadmap and meeting the objectives set in the corporate Environmental and Climate Change Strategy, Nornickel has been improving its climate risk management.

Developing climate risk management procedures

	1 Forecast	2 Identification	3 Assessment	4 Mitigation and adaptation	5
Physical risks	Forecasting climate risk factors for regions of operation	Analysing the incorporation of climate risk factors into risk assessments, identifying new risks	Assessing the impact on the Company's financial performance	Developing mitigation and adaptation tools	Integrating risks into the Company's business processes
Transition risks and opportunities	Developing our own scenarios for the global economy and climate change	Identifying transition risks and opportunities			

[1] The Bank of Russia's Information Letter No. IN-06-28/49, On Recommendations for Public Joint Stock Companies to Disclose Non-Financial Information Related to Their Activities, dated 12 July 2021.

The analysis of physical risks relies on public scenarios of the Intergovernmental Panel on Climate Change (SSP1-2.6, SSP2-4.5, SSP5-8.5) localised for all regions where the Company operates its production facilities. To analyse transition risks, we rely on our own scenarios for the global economy and climate change until 2050. As part of permafrost thawing risk management, the Company further develops its facility monitoring system for continuous automated monitoring of permafrost foundation soil temperature and foundation deformations. The monitoring system is developed by the Buildings and Structures Monitoring Centre, which is responsible for technical supervision and permafrost monitoring and serves as a centre of excellence in engineering geology.

Physical risks

Permafrost degradation

Loss of bearing capacity by pile foundation beds may lead to deformation and collapse of buildings and structures.

Key risk factors	Effect on Nornickel's development goals and strategy	Risk assessment	Key mitigants
Average annual temperature increases, including over the last 15 to 20 years, that have resulted in a deeper seasonal permafrost thawing	• Effective delivery of finished products (metals) in line with the production programme • Social responsibility: comfort and safety of people living in Nornickel's regions of operation • No emergency situations of interregional or nationwide scale, including environmental damage	• Effect on objectives: **medium** • Risk source: **external** • Year-on-year change in risk: **stable**	To manage this risk, Nornickel: • regularly assesses the ongoing technical condition of Nornickel's buildings and structures by tracking soil temperature in the foundations of buildings and structures, conducting geodetic surveys to measure their movement, and scaling the information and diagnostic system (in particular, through deploying automated observation points to monitor the key factors that affect the safe operation of buildings and structures) • takes corrective and adaptive actions to ensure that buildings and structures are technically operational.

Low water levels in rivers

Water shortages in storage reservoirs of Nornickel's hydropower facilities may result in failure to achieve required water pressures at HPP turbines, leading to lower power output and to drinking water shortages in Norilsk.

Key risk factors	Effect on Nornickel's development goals and strategy	Risk assessment	Key mitigants
Extreme weather events (droughts) caused by climate change	• Social responsibility: comfort and safety of people living in Nornickel's regions of operation • Lower share of renewables in the Company's energy mix	• Effect on objectives: **medium** • Risk source: **external** • Year-on-year change in risk: **stable**	To manage this risk, Nornickel: • improves the performance of the closed water circuit to reduce fresh water withdrawal from surface sources (water bodies) • carries out regular hydrological observations to forecast water levels in rivers and other water bodies • cooperates with the Federal Service for Hydrometeorology and Environmental Monitoring (Rosgidromet) on setting up permanent hydrological and meteorological monitoring stations in order to improve the accuracy of water level forecasts for major rivers across Nornickel's regions of operation • dredges the Norilskaya River in the water withdrawal areas to increase water withdrawal reliability during low water periods • implements a number of measures to reduce water consumption by boosting the performance of equipment and production chains • replaced hydropower units at the Ust-Khantayskaya HPP to increase power output through improving the hydropower units' performance.

Transition risks and opportunities

To assess risks and opportunities arising from the global energy transition, Nornickel has developed three own long-term scenarios for the global economy and climate change.

For this exercise, we engaged experts from the Institute for Economic Forecasting of the Russian Academy of Sciences (IEF RAS) and conducted an analysis of some 190 available public scenarios from widely recognised sources. The resulting three global economy and climate change scenarios are aligned with climate change pathways described in IPCC's public scenarios SSP1-2.6, SSP2-4.5, and SSP5-8.5.

At the end of 2024, the scenarios were updated to reflect actual data for 2022–2023 and the extension of the forecast horizon to 2060. The probability of the Rapid Transition scenario was lowered from 25% to 20% due to a more than 2% increase in global emissions over 2021–2023, which hampers the decarbonisation of the global economy. The probability of the Sustainable Palladium scenario was raised to 75% as it aligns most closely with current trends.

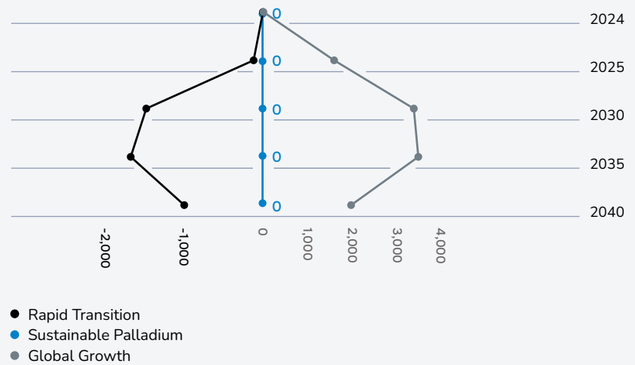
Key characteristics of the scenarios developed to assess transition risks and opportunities until 2060

Scenarios	Rapid Transition SSP1-2.6	Sustainable Palladium SSP2-4.5	Global Growth SSP5-8.5
Probability	20%	75%	5%
Development focus	Low-carbon development paradigm with the global community's efforts focused on the reduction of GHG emissions	Maintaining current socioeconomic trends. Traditional industries remain centre stage along with the green economy	Abandoning efforts to curb climate change with further rapid economic growth fuelled by hydrocarbons
Inflation	High	Moderate	Low
Resource/energy intensity	Low	Moderate reduction	High
Climate regulation	Strict	Moderate	Insignificant
CO_2 prices	Major increase	Moderate increase	At 2021 levels
Temperature change by 2050[1]	+1.8 °C	+2.0 °C	+2.4 °C

The Company has chosen the Sustainable Palladium as its baseline scenario, according to which traditional industries are expected to remain centre stage along with the growing green economy. In particular, internal combustion engine vehicles are expected to retain a large market share, resulting in a steady long-term demand for palladium. The other two scenarios are used by the Company to stress-test climate-related risks.

[1] Growth in temperature vs pre-industrial levels.

Scenario analysis of the consolidated financial and economic model until 2040



The analysis has shown that the EBITDA forecast is most favourable for the Company in the Global Growth scenario

Based on the updated scenarios, Nornickel has conducted a scenario analysis of the consolidated financial and economic model until 2040. The analysis has shown that the EBITDA forecast is most favourable for the Company in the Global Growth scenario and least favourable in the Rapid Transition scenario. The key growth drivers behind the highest EBITDA figures in the Global Growth scenario include the highest GDP and population growth rates, which will fuel the strongest demand for palladium and copper vs the other two scenarios. However, the Company estimates the probability of the Global Growth scenario at 5%.

Although the Rapid Transition scenario is based on the most aggressive decarbonisation rates, which is impossible without green metals – nickel and copper, – the scenario projects the global economy to slow down, with the lowest GDP and population growth rates. On top of that, the total car fleet, along with the fleet of passenger EVs, hydrogen cars, and plug-in hybrids, in the Rapid Transition scenario will be lower than that in the Sustainable Palladium scenario as a result of the general trend towards reduction in car ownership and use as well as ride-sharing development. The probability of the Rapid Transition scenario is estimated at 20%

After 2034, the stress scenarios are closer to the Sustainable Palladium baseline scenario due to their different metal price growth rates, which are higher in Rapid Transition and, in contrast, lower in Global Growth vs Sustainable Palladium.

For the full list of climate-related risks, please see Nornickel's Climate Change Report.