Climate-related risks and opportunities

GRI 201-2 / TCFD Sa, Sb, Sc, Ra, Rb, Rc / TNFD Sa, Sb, Sc, Ra, Rb, Rc

GRI 14.2.2

Guided by the TCFD recommendations, COSO standards, and the 2031 Environmental and Climate Change Strategy, Nornickel is building procedures for managing climate-related risks and opportunities. The Company follows the TCFD classification, which identifies two key categories of risks and opportunities:

- Physical risks, whose impacts may manifest through extreme weather events (acute risks) or lasting changes in weather patterns (chronic risks)
- Transition risks and opportunities, associated with evolving market, regulatory, technological, and political environment as the economy transitions to a low-carbon model

In 2024, the Company continued to refine its approaches to assessing physical risks and transition risks and opportunities. The relevant risk assessment framework was reviewed by the Sustainable Development and Climate Change Committee of the Board of Directors of MMC Norilsk Nickel.

Climate risk management procedures

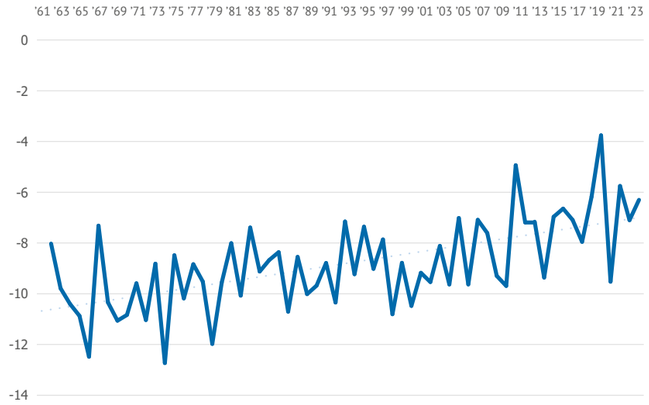
Risks	Physical risks	Transition risks and opportunities
Forecast	Forecasting climate risk factors for regions of operation	Developing our own scenarios for the global economy and climate change
Identification	Analysing the incorporation of climate risk factors into risk assessments, identifying new risks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

Public reporting

Physical risks

The analysis of historical climate data since the 1960s confirmed a trend indicating shifts in several climate factors. For example, in Norilsk, average temperature has increased by 0.6 °C every decade, suggesting that temperatures in the Arctic are rising faster than the global average.

Norilsk weather station. Average air temperature in 1961–2022 (°C)



In addition to evaluating the long-term climate trends identified in Nornickel's regions of operation since the mid-20th century, the Institute of Atmospheric Physics of the Russian Academy of Sciences (IAP RAS) developed climate projections up to 2050. The regional forecasts are based on three IPCC global scenarios (SSP1-2.6, SSP2-4.5, and SSP5-8.5) and the CMIP6[1] ensemble of climate models.

To prevent risks associated with permafrost degradation in the Norilsk Industrial District, theCompany conducts ongoing monitoring of the technical condition of assets through expert examinations, surveys, and monitoring of the condition of permafrost soils and building foundations.

For the description of the IPCC scenarios and modelling results for projected changes in climate factors until 2050, please see Nornickel's 2024 Climate Change Report.

Factors		Mitigation			
		Monitoring	Repairs	Reconstruction	Construction
Permafrost degradation	Power lines	✓	✓		✓
	Gas pipelines	✓	✓		
	Heat and water supply pipelines	✓	✓	✓	✓
	Fuel storage tanks	✓	✓	✓	✓
	Railroads	✓	✓		
Increased frequency of thunderstorms	Equipping power lines with lightning surge protection systems and monitoring the number of lightning strikes on power grid facilities				
Higher frequency of heavy precipitation	Maintaining and modernising hydraulic structures to ensure technical reliability				
Higher annual precipitation	Monitoring the technical condition of facilities and water levels in the Norilskaya River and water reservoirs				

According to the assessment, the impact of climate risk factors in the short- and medium-term horizon until 2028 is mitigated through operational activities, initiatives, and investment projects aimed at enhancing the reliability of industrial assets and infrastructure.

[1] Coupled Model Intercomparison Project.

Transition risks and opportunities

In 2022, to identify and assess relevant transition risks and opportunities, Nornickel – in collaboration with the Institute for Economic Forecasting of the Russian Academy of Sciences – developed three proprietary long-term scenarios for global economic and climate development through 2050. The projected changes in global temperature under these scenarios are consistent with the three IPCC scenarios (SSP1-2.6, SSP2-4.5, and SSP5-8.5), which the Company also uses for its assessment of physical climate risks.

In 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.

For a full list of transition risks and opportunities, please see Nornickel's 2024 Climate Change Report.

The underlying assumptions of each scenario differ significantly, with these differences directly linked to the Company's product portfolio. The Sustainable Palladium scenario is considered baseline; it provides for traditional industries to remain centre stage along with the growing green economy. For example, internal combustion engine (ICE) vehicles will retain a large market share, contributing to robust demand for palladium in the long run. The other two scenarios are used by the Company to stress-test climate-related risks.

Key transition risks identified by the Company include:

- the need to comply with carbon regulations in Russia and in the jurisdictions to which the Company exports its products
- restrained demand for primary platinum group metals due to declining sales of internal combustion engine vehicles
- restrained demand for primary nickel due to a decline in overall vehicle production and the development and mass production of new nickel-free batteries

The Company sees the following transition opportunities:

- Higher demand for primary nickel and copper, driven by transport electrification, the expanding hybrid vehicle market, and the growth of renewables
- Growing demand for primary platinum group metals due to the use of platinum and palladium in the hydrogen economy and of palladium in vehicle hybridisation
- Sale of carbon credits generated by climate projects

To mitigate risks arising from the need to comply with carbon regulations, the Company regularly monitors legislation both in Russia and in its export markets.

The introduction of the CBAM[1] in the European Union does not pose any risk to the Company in the short term, as non-ferrous and platinum group metals are not currently covered by the cross-border carbon tariff. The Company continues to monitor developments in carbon regulation and to forecast the potential associated costs going forward.

In the long term, Nornickel relies on its competitive advantage – one of the lowest product carbon footprints in the industry.

Sustainability assessment of Nornickel's product portfolio

One of the key drivers of Nornickel's long-term strategy is the growing demand for the Company's metals to support the development of a low-carbon economy. By supplying green metals to the market, the Company is already actively contributing to the global transition to cleaner modes of transport and renewable energy.

For a detailed metal demand outlook, please see Nornickel's 2024 Climate Change Report.

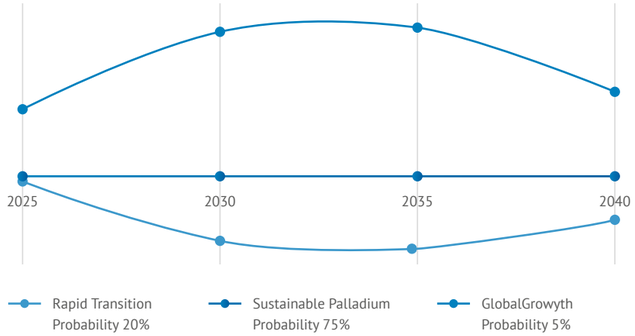
Key climate change factors affecting demand for the Company's key products

Factors	Ni	Pd/Pt	Cu
Growth of battery electric vehicle (BEV) market share	↑	↓	↑
Expansion of the hybrid vehicle market	↑	↑	↑
Growth of the fuel cell market and the hydrogen economy	→	↑	→
Increased power generation from renewables / low-carbon fuels	↑	↑	↑
Expansion of energy-storage and charging infrastructure to support growth in EVs	↑	→	↑
Net effect	↑	→	↑

[1] Carbon Border Adjustment Mechanism.

Scenario analysis of the consolidated financial and economic model until 2040

EBITDA deviation under stress scenarios from the Sustainable Palladium baseline 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.

Nornickel's climate change adaptation efforts

Permafrost monitoring

To ensure ongoing control over the risk factor of permafrost degradation, Nornickel has deployed a monitoring system that covers two key areas:

- **Geotechnical monitoring** – conducted in the Norilsk Industrial District since 2020. Its main objective is to monitor the technical condition of foundations and load-bearing structures of buildings and structures built on permafrost and promptly identify threats during operation
- **Background monitoring** – conducted by the Company since 2023 in partnership with Fedorovsky Polar State University. This monitoring programme focuses on applying scientific methods to assess the state of permafrost and forecast its condition over the medium and longer term in the natural landscapes of the Norilsk Industrial District

These activities are carried out by the Buildings and Structures Monitoring Centre in Norilsk and the Department for Scientific and Technical Support for Building and Structure Operation in the Far North.

All information is stored and processed in a unified information and diagnostic system deployed at the Norilsk production site, enabling the Company's managers to use consolidated data for management decision making.

For more details on geotechnical and background monitoring, please see Nornickel's 2024 Climate Change Report.

Nornickel's permafrost monitoring system[1]

Geotechnical monitoring of buildings and structures

Goals:
- Safe operation of Company BS
- Assessment of BS condition and forecasting of changes in BS technical condition
- Introduction of new monitoring methods

Background permafrost monitoring system

Goals:
- Assessment of climate impact on permafrost within the covered areas
- Intensification of scientific research in permafrost science and climate change in the region

Geotechnical monitoring across BS

- Geophysical surveys:
  - Ground-penetrating radar (GPR) studies
- Instrumental measurements:
  - Geodetic
  - Geothermal
  - Hydrogeological
- Expert subsystem (visual inspection results)
- Groundwater level monitoring in wells
- Maintaining a digital archive of design, survey, and expert review documents
- Monitoring of ambient air temperature and other climatic parameters
- Monitoring of humidity and temperature in crawl spaces
- Monitoring changes in BS geometry
- Borehole temperature monitoring

Satellite monitoring
- Determination of atmospheric meteorological parameters

Engineering and geological surveys
- Snow cover characterisation

Comprehensive inspections
- Assessment of thermal insulation provided by vegetation

Development and refinement of GTM programmes
- Geocryological studies of permafrost soils

Instrumental surveys

Study of geocryological processes

Drilling

Laboratory tests

Thermometric measurements

Geophysical surveys

Monitoring results analysis

Risk-based approach to asset operation

Monitoring results analysis

Projections of climate impact on permafrost

Monitoring system's IT core: Polar Division's information and diagnostic system

Core | Analytics | Storage | **Reporting**

[1] BS – buildings and structures, GTM – geotechnical monitoring.

Product portfolio diversification

The Company has adopted the Innovation Strategy that provides for the development of new products to mitigate market risks and capture opportunities linked to the energy transition.

Nornickel has also established the Palladium Centre, which develops, tests, and brings to market new palladium-based materials that support the accelerated transition to green technologies and help reduce carbon footprints. New products are being developed for hydrogen and solar power as well as for aviation fuels.

For more details on the development of palladium-based technologies, please see the Research and Development section.

To meet the growing demand for battery materials, in 2024, the Company inaugurated a Battery Technology Centre in Saint Petersburg, which focuses on building technological capabilities in nickel-bearing cathode active materials (CAMs) – a key component in modern batteries.

For more details on efforts in this area, please see the Research and Development section.

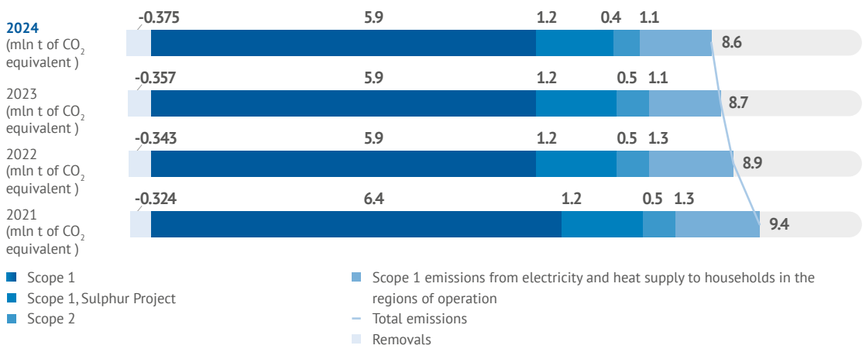
In addition, Nornickel, together with a partner, plans to develop Russia's most promising lithium deposit, located in the Murmansk Region. The project provides for the production of 45 kt of lithium carbonate and hydroxide per year.

Greenhouse gas emissions and carbon footprint of products

GRI 2-4, 305-1, 305-2, 305-4 / SASB EM-MM-110a.1 / UNCTAD B.3.1, B.3.2 / MED-20 / TCFD Mb / TNFD Mb

GRI 14.1.5, 14.1.6, 14.1.8

Nornickel uses the GHG Protocol methodology to calculate its greenhouse gas emissions (Scope 1 and 2). The calculation covers carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4). The quantification includes direct and indirect GHG emissions as well as the Company's estimated prospective emissions related to the implementation of the Sulphur Project at Nadezhda Metallurgical Plant[1].



[1] In the reporting year, the Company adjusted the GHG emissions provision for the Sulphur Historically, this value stood at 2.2 mln t of CO_2 equivalent. However, due to changes in plans for the Copper Plant's Sulphur Project, post-implementation emissions are now expected to be lower, at 1.2 mln t of CO_2 equivalent (subject to update once the project reaches full capacity). This adjustment, among other factors, was also used to restate Scope 1 and 2 GHG emissions for previous reporting periods.

The intensity of GHG emissions (Scope 1 and 2) was 6.5 t of CO_2 equivalent per RUB 1 million of revenue under consolidated financial statement disclosures[3].

Across the Nornickel Group, a steady downward trend in GHG emissions has been observed over a four-year horizon.

In 2024, direct and indirect GHG emissions (Scope 1 and 2) from production and other activities of the Nornickel Group, taking into account the adjustment for the Sulphur Project's GHG emissions provision, amounted to 8.6 mln t of CO_2 equivalent, including 8.2 mln t of direct emissions[2] and 0.4 mln t of indirect emissions.

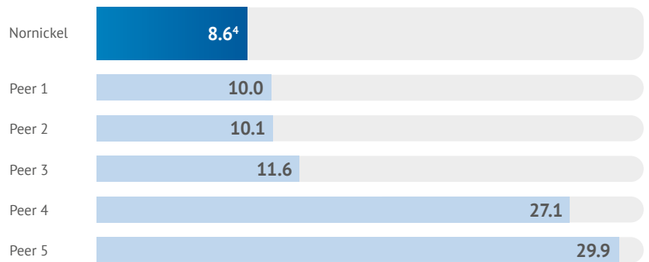
GHG emissions for the Nornickel Group decreased year-on-year in 2024. It should be noted that the Energy Division's energy enterprise has cut its GHG emissions by more than 2% compared to 2023. The reduction was driven by lower per unit fuel consumption for heat and electricity generation, which resulted from optimised equipment operating modes at CHP plants, as well as favourable weather conditions in the Norilsk Industrial District during the autumn-winter period. The update of regional CO_2 emission factors for electricity supply within the energy systems of the Murmansk Region and Trans-Baikal Territory have also contributed to a reduction in Scope 2 GHG emissions. Notably, the Trans-Baikal Division signed a bilateral power purchase agreement (PPA) with a certified low-carbon energy supplier (a hydropower plant) for a total of 124.9 mln kWh. This PPA helped reduce Scope 2 GHG emissions by more than 126 kt of CO_2 equivalent in 2024.

Emissions data verification by an independent auditor

GHG emissions (Scope 1 and 2) and removals for the Group in 2024 were verified by an international company.

Comparison with global metals and mining peers

GHG emissions (Scope 1 and 2) (mln t of CO_2 equivalent)



Sources: Company analysis, peers – latest available data (fiscal year 2023 or 2024). Peers include leading global diversified metals and mining companies: BHP Billiton, Rio Tinto, Vale, Glencore, and Anglo American.

[2] Including a GHG emissions provision for the Sulphur Project at Nadezhda Metallurgical Plant and GHG emissions generated from heat and electricity supplies to the public. In 2024, actual direct and indirect (Scope 1 and 2) GHG emissions reached 7.5 mln t of CO_2 equivalent, including Scope 2 GHG emissions at 0.4 mln t of CO_2 equivalent (calculated using the location-based method) as well as actual emissions from the Sulphur Project at Nadezhda Metallurgical Plant and GHG emissions generated from heat and electricity supplies to the public (the Sulphur Project GHG emissions provision at Nadezhda Metallurgical Plant was determined separately).

[3] Net of the Sulphur Project GHG emissions provision at Nadezhda Metallurgical Plant, but including actual emissions from the Sulphur Project in 2024.

[4] Including a GHG emissions provision for the Sulphur Project at Nadezhda Metallurgical Plant and GHG emissions generated from heat and electricity supplies to the public.