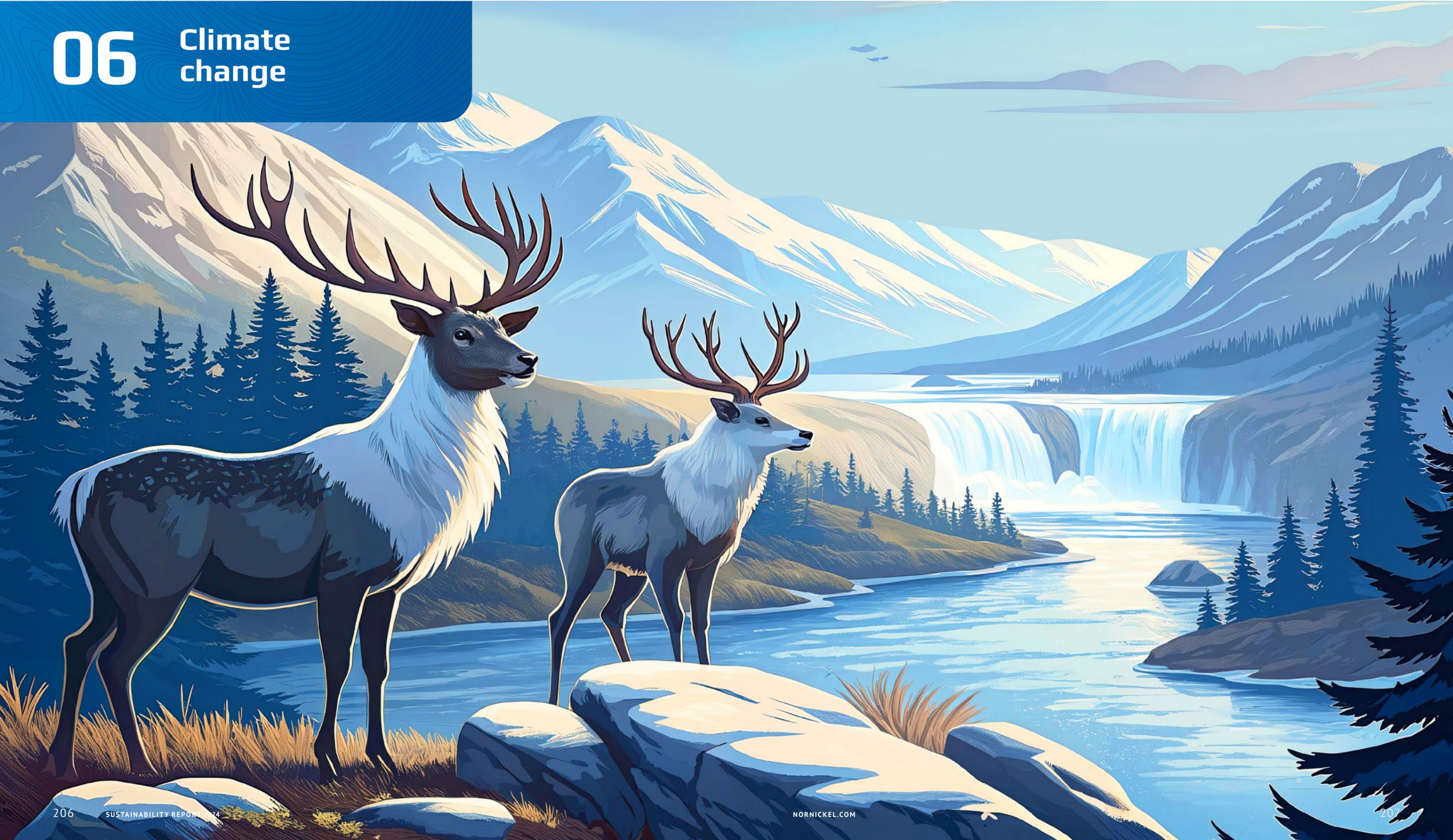


06 Climate change



Highlights and results



8.6 mln t of CO₂ equivalent¹
Actual GHG emissions (Scope 1 and 2)

5.5 mln t of CO₂ equivalent
Greenhouse gas emissions, downstream Scope 3

11.9%
share of renewables in total electricity and fuel consumption across the Group

USD 49 per t of CO₂ equivalent
internal carbon price³

1.2 mln t of CO₂ equivalent
Provision for GHG emissions from the Sulphur Project at Nadezhda Metallurgical Plant, Scope 1

1.2 mln t of CO₂ equivalent
GHG emissions, upstream Scope 3

54.4%
share of renewable electricity across the Group

RUB 4.8 billion
spending on climate action initiatives

Product carbon footprint according to ISO 14044 (GWP 100), kg of CO₂ equivalent per g of metal²

Pd	Pt
24.6	24.7
Rh	
36.9	

Product carbon footprint according to ISO 14044 (GWP 100), kg of CO₂ equivalent per kg of metal²

Metal	Sulphate
Ni	Co
8.9	2.6
Sulphate	Cathodes
Ni	Cu
3.0	3.8
Metal	
Co	
39.0	

Building and Structure Monitoring System project

~1,000 facilities are connected to the information and diagnostic system, including 222 with automated monitoring in place

Nornickel's contribution to the Efficient and Competitive Economy national project and the Stable and Dynamic Economy national goal

Targets and objectives under the national goal

(v) Approve and implement climate change adaptation programmes at the federal, regional, and corporate levels

(w) Establish a national monitoring system for climate forcers

Relevant UN SDGs



Related federal projects

Low-Carbon Development

Nornickel's key initiatives and focus areas

8.6 mln t of CO₂ equivalent – Gross Scope 1 and 2 GHG emissions (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)

11.9% – share of renewables in total electricity and fuel consumption across the Group

Implementation of a renewable-energy project in the Trans-Baikal Territory, a project for mineralisation of mining waste, and use of energy-efficient technologies and equipment

Registration of Nornickel's first climate projects in the Russian Register of Carbon Units, execution of carbon unit purchase transactions



¹ Including a GHG emissions provision for the Sulphur Project at Nadezhda Metallurgical Plant as well as GHG emissions generated from heat and electricity supplies to the public.

² Group data for 2024, including foreign entities.

³ Approach to calculation: shadow pricing.

Approaches to climate change management

Nornickel's approach to climate change



Nornickel recognises and considers the risks associated with the challenge of global climate change and contributes to the implementation of the Paris Agreement's goals to hold the increase in the global average temperature to well below 2 °C and pursue efforts to limit the rise to 1.5 °C above pre-industrial levels by the end of the 21st century. As a signatory to the UN Global Compact, the Company fully supports the UN Sustainable

Development Goals (SDGs), in particular SDG 13: Climate Action. In addition, Nornickel contributes to the achievement of national climate policy goals and objectives as set forth in the [Climate Doctrine of the Russian Federation](#) and the [Strategy of Socio-Economic Development of the Russian Federation with a Low Level of Greenhouse Gas Emissions until 2050](#).

Practical implementation of the above statements

Nornickel develops innovative technology solutions and implements climate change adaptation projects, including those related to monitoring the condition of permafrost soils in its regions of operations

Nornickel is developing innovative projects focused on expanding renewable energy capacity and enhancing greenhouse gas absorption by waste materials in tailings storage facilities

Nornickel is implementing its 2031 Environmental and Climate Change Strategy. This strategy enables the Company to maintain some of the lowest greenhouse gas emissions and one of the most competitive product carbon footprints among major global industry peers, even as production volumes increase

Nornickel provides financial and organisational support for scientific research and development projects related to climate change, and collaborates with research institutions

Nornickel is pursuing a business strategy aimed at growing the production and sales of metals that are critical for the global transition to a green economy

Nornickel engages with the expert community, professional associations, and public authorities on climate change matters

Why climate change issues are important to the Company

Global warming issues are of particular relevance to Nornickel, as the Company's core production and energy assets are located within the Arctic zone. Various experts estimate that the average surface temperatures in the Arctic are rising three to four times faster than the global average, posing additional operational risks. The primary threat stems from permafrost thawing, which undermines the stability of building and structure foundations.

The Company's green metals basket is already widely used in transport, infrastructure, renewables, and hydrogen energy sectors. In addition, Nornickel plans to launch new products based on its metals for use in areas such as hydrogen and solar energy as well as aviation fuels.

Climate change governance

Allocation of responsibilities

GRI 2-9, 2-12, 2-13 / TCFD Ga, Gb / TNFD Ga, Gb

Nornickel has established a comprehensive system for managing climate change-related matters.

Responsibility is allocated vertically, starting from top – with the Company's key governance bodies: the Board of Directors and the Management Board of MMC Norilsk Nickel.

The Board of Directors reviews and approves the strategic targets set out in the 2031 Environmental and Climate Change Strategy, sets the Company's risk appetite, and oversees the management of climate-related risks.

To ensure deeper consideration of these matters, the Board established the Sustainable Development and Climate Change Committee.

Matters reviewed by the Sustainable Development and Climate Change Committee

Integrating sustainability principles, including climate change, into Nornickel's activities

Managing risks and internal controls related to sustainable development and climate change

Overseeing the external audit of the Company's sustainable development and climate change reporting

Preparing the Company's internal reports and disclosures on sustainable development and climate change

Developing and implementing the 2031 Sustainable Development and Climate Change Strategy

For a detailed chart of functional responsibilities, please see [Nornickel's 2024 Climate Change Report](#).

The implementation of climate-related risk management process is, among other responsibilities, assigned to the Risk Management Committee under the Management Board of MMC Norilsk Nickel. Members of the Management Board coordinate the parameters of the Company's risk appetite, including those related to climate change (such as greenhouse gas emissions), and provide recommendations to the Board of Directors for approval. Key risks, including those associated with climate change, are reviewed on a quarterly basis.

Executive responsibility for overseeing the development and implementation of the 2031 Environmental and Climate Change Strategy lies with the Vice President for Ecology and Industrial Safety, who also supervises the Sustainable Development Department and the Ecology Department at the Company's Head Office.

Corporate documents on climate change

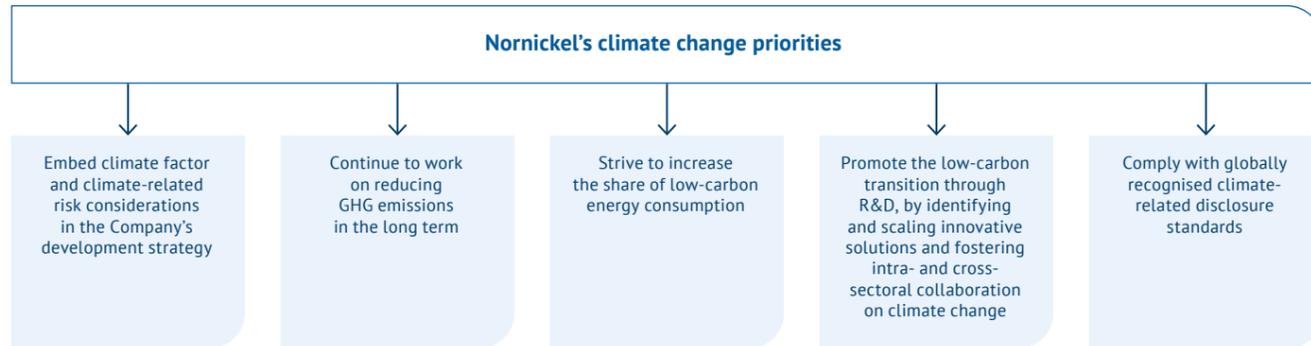
The Company's climate change vision is set out in a number of corporate documents approved by the Board of Directors:

- [PJSC MMC Norilsk Nickel's Climate Change Policy](#)
- [PJSC MMC Norilsk Nickel's Environmental Policy](#)
- [Renewable Energy Sources Policy](#)
- [2031 Environmental and Climate Change Strategy](#)

The fundamental corporate document on climate change is [MMC Norilsk Nickel's Climate Change Policy](#), which sets out the Company's key commitments.

Nornickel's climate change strategy and projects

SASB EM-MM-110a.2, TCFD Ma, Mc



Nornickel's key climate-related targets are set out in the [2031 Environmental and Climate Change Strategy](#), which was updated in 2024.

In addition, the 2031 Environmental and Climate Change Strategy sets compliance with international standards and methodologies as a formal objective, including: TCFD recommendations, ICMM Principles, and the IRMA Standard for Responsible Mining.

Alongside the updated 2031 Environmental and Climate Change Strategy, the Board of Directors also approved Nornickel's Key Focus Areas of Carbon Neutrality in the reporting year. This document outlines priority project and programme areas focused on reducing gross GHG emissions and lowering the Company's carbon footprint – both within the environmental strategy's implementation horizon and over the longer term.

Key focus areas of carbon neutrality



The approved focus areas of Nornickel's carbon neutrality pathway enable the Company to initiate the development and selection of the highest-impact projects within each area. In 2024, the Company started to develop and implement projects across the following focus areas:

- Promotion of low-carbon energy sources (development of a renewable-energy project in the Trans-Baikal Territory)

- Exploring the potential for the conversion of pit machinery to alternative fuels
- Direct absorption of greenhouse gases by waste materials in tailings storage facilities
- Implementation of climate projects
- Use of energy-efficient technologies and equipment

Climate change adaptation plan

To support the Company's strategic objectives in the areas of Climate Change and Compliance with International Standards, Nornickel has developed an action plan for 2024–2025. The tasks scheduled for 2024 have been successfully achieved. For more details on the plan, please see [Nornickel's 2024 Climate Change Report](#).

For more details on these projects, please see the [Decarbonisation Projects](#) sub-section.

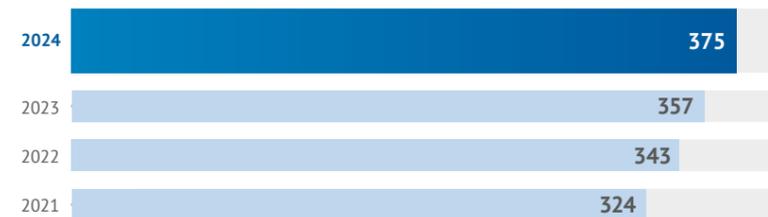
Decarbonisation projects

Mineralisation of mining waste

Research into the mineral sequestration of carbon dioxide has been under way since the late 20th century, but has significantly intensified over the past two decades due to the global search for safe, environmentally sound, and long-term solutions for CO₂ disposal. The CO₂ mineralisation process involves the reaction of carbon dioxide with various minerals – such as olivine, serpentine, and other silicates containing calcium, magnesium, and iron – in the presence of water. During the reaction, CO₂ binds with the cations of these elements to form carbonates, thus converting into a solid phase.

In 2024, TÜV AUSTRIA validated Nornickel's methodology for calculating direct GHG absorption through gangue mineralisation in tailings storage facilities to GOST R ISO 14064-1-2021. The methodology outlines an approach for measuring carbon dioxide absorption through passive (non-anthropogenic) carbonation of certain minerals in the waste rock (tailings) stored at the Company's tailings storage facilities. The rate of passive carbonation depends on several factors, including the mineralogy of the parent ore and tailings, particle size, climatic conditions, and pore water chemistry. One of the key factors influencing the efficiency of the mineralisation process is the acid–alkaline balance of the solution in which the reaction occurs. To estimate the amount of CO₂ absorbed by tailings, instrumental analytical methods are used, including infrared (IR) spectroscopy, X-ray diffractometry, and CHNS(CN) elemental analysis, which determine the carbon content in the pulp and tailings. Data on actual absorption for 2021–2024 have been verified by an international independent company. The amount of direct GHG absorption depends on the volume of waste rock generated during the reporting period and disposed of at the Group's tailings storage facilities.

Direct GHG absorption (kt of CO₂ equivalent)



Nornickel plans to further develop this project, with detailed studies of artificial and active mineralisation in tailings storage facilities scheduled to start as early as 2025. These approaches have greater potential for greenhouse gas capture compared to natural mineralisation.



Use of renewables in energy and transport

Favourable climatic conditions make the Trans-Baikal Territory one of Russia's leading regions in terms of insolation (amount of sunshine). In October 2024, Nornickel signed an EPC contract for the construction of a 518-kW solar power plant at the existing rotation camp of its production site in the Gazimuro-Zavodsky District of the Trans-Baikal Territory. Nornickel plans to commission the facility in the second half of 2025, becoming the first mining company in the region to begin adopting renewable energy technologies.

In addition, the Company is considering the use of electric dump trucks for ore transportation at its production sites in the Trans-Baikal Territory and the Murmansk Region.

Energy efficiency

Fuel and energy savings resulting from energy consumption reduction and energy efficiency initiatives in 2024 (TJ)

GRI 302-4, GRI 305-5

GRI 14.1.9

Indicators	Group's total	Including by division		
		Polar Division	Energy Division	Trans-Baikal Division
Total savings	782.8	556.7	145.2	80.9
Including:				
• electricity	382.6	301.7	-	80.9
• heat in water and steam	255.0	255.0	-	-
• fuel	145.2	0	145.2	-



The implementation of the Energy Efficiency Program is one of the key avenues for achieving the targets set out in Nornickel's 2031 Environmental and Climate Change Strategy. Its activities help reduce actual energy consumption and GHG emissions.

In 2024, as a result of implemented energy efficiency initiatives, the Company saved 782.8 TJ of energy. The total cost of these projects amounted to RUB 4.8 billion. GHG emissions reductions achieved:

- Scope 1 – 79.2 kt of CO₂ equivalent
- Scope 2 – 180.5 kt of CO₂ equivalent (including reductions resulting from direct bilateral power purchase agreements for low-carbon electricity)

Key initiatives and technologies used

Initiative/technology	Impact
Switching to LED lighting	LED lamps consume significantly less energy than traditional lighting, helping to reduce electricity consumption and costs
Improved thermal insulation	Using modern insulation materials for pipelines, windows, and doors minimises heat losses and lowers energy consumption for space heating
Automatic regulation of heat supply	Automated systems adjust heat supply based on ambient temperature, optimising energy use and preventing excessive heating
Installation of frequency converters	Frequency converters regulate equipment speed based on load, reducing energy consumption in core and auxiliary process units
Replacement of transformer fleet	Installation of transformers with the lowest steel losses cuts energy losses in electricity transmission and distribution
Conversion of mine air heaters to alternative energy sources	Switching to cleaner and more energy-efficient heating options for mines contributes to lower GHG emissions
Decentralisation of air supply in mines	Decentralised air supply systems help optimise energy use and reduce transmission losses

Nornickel's climate project in the Russian Register of Carbon Units

[Nornickel's first climate project registered in the Russian Registry of Carbon Units was implemented at the Kola production site in the Murmansk Region.](#) The main ventilation units at Severny Mine were switched from fuel oil to electric heating, enabling the retirement of the onsite oil-fired boiler and resulting in a reduction of 17.5 kt of CO₂ equivalent in GHG emissions. Technical implementation

of the project was completed in 2022, and on 20 November 2024, it successfully passed validation confirming its climate project status. In December, the project was officially registered in the Carbon Register.



We have implemented many initiatives as part of our climate agenda. For example, we signed Russia's largest-ever deal to purchase carbon units. While the volume might be modest on a global scale, it marked a significant milestone for the Russian market. But we didn't stop there. At the Kola site, when transitioning our mines to electric heaters, we formalised this as a climate project, underwent a complex verification process, and received official confirmation towards the end of last year.

We plan to continue registering all energy efficiency projects with the parallel registration of carbon credits. We would like to see the national carbon market become fully operational, and we are actively contributing to its development, as it can become a valuable tool for carbon credit trading and offsetting. This is another step towards decarbonising our production cycle and manufacturing products aligned with modern environmental trends.

Stanislav Seleznev,
Vice President for Ecology and Industrial Safety

Integrating climate change into the supply chain

The Company manages a responsible supply chain, which may help reduce indirect GHG emissions in the long term. The first step was the adoption of the [PJSC MMC Norilsk Nickel's Supplier Code of Conduct](#), which sets out Nornickel's expectations for suppliers, including requirements to reduce GHG emissions. Since 2021, questions related to GHG emissions have been included in the scope of the mineral supplier¹ due diligence process; since 2023, they have also been part of the assessment procedure for the sustainability practices of suppliers of goods, works, and services. For more details on supplier engagement on sustainability, please see [Nornickel's 2024 Responsible Supply Chain Report](#).

¹ The Company's mineral suppliers include suppliers of mined minerals (primary processed material which has never been previously refined) and suppliers providing minerals transportation, their processing and loading/unloading services. "Minerals" are minerals containing nickel, cobalt, and copper.

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

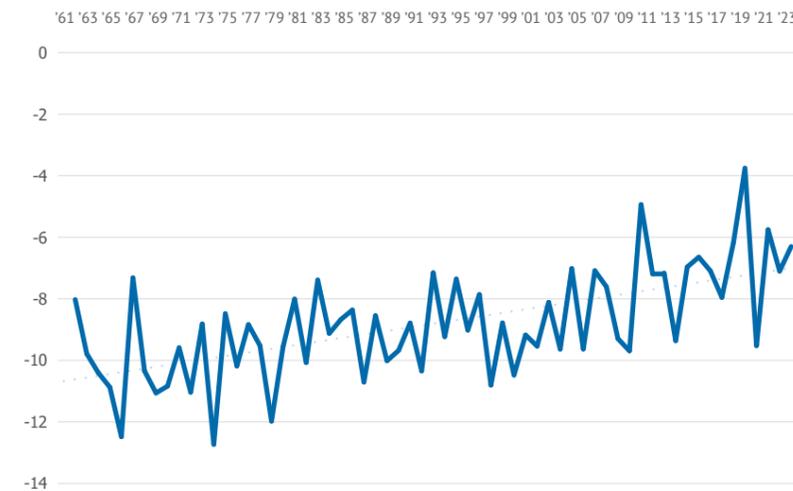


Physical risks

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 CMIP6¹ ensemble of climate models.

To prevent risks associated with permafrost degradation in the Norilsk Industrial District, the Company 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, Nor Nickel – 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.

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

For a full list of transition risks and opportunities, please see [Nor Nickel's 2024 Climate Change Report](#).

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 CBAM¹ 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, Nor Nickel relies on its competitive advantage – one of the lowest product carbon footprints in the industry.

Sustainability assessment of Nor Nickel's product portfolio

One of the key drivers of Nor Nickel'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 [Nor Nickel's 2024 Climate Change Report](#).

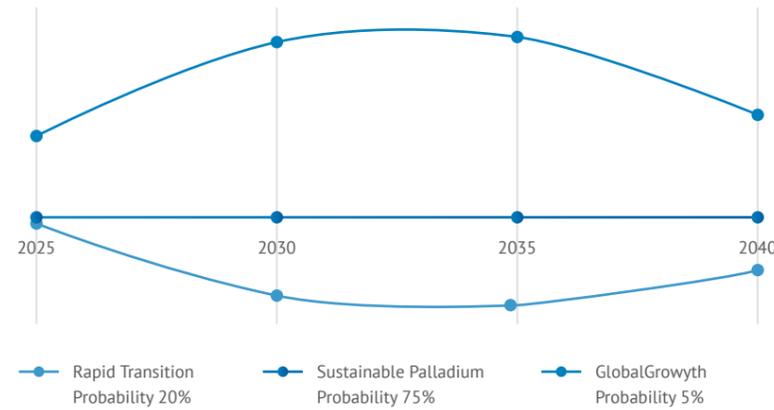
Key climate change factors affecting demand for the Company's key products

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 system¹

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

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

Engineering and geological surveys

Comprehensive inspections

Development and refinement of GTM programmes

Instrumental surveys

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

Determination of atmospheric meteorological parameters

Study of geocryological processes

Snow cover characterisation

Drilling

Assessment of thermal insulation provided by vegetation

Laboratory tests

Geocryological studies of permafrost soils

Thermometric measurements

Geophysical surveys

Monitoring results analysis

Monitoring results analysis

Risk-based approach to asset operation

Projections of climate impact on permafrost

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



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.

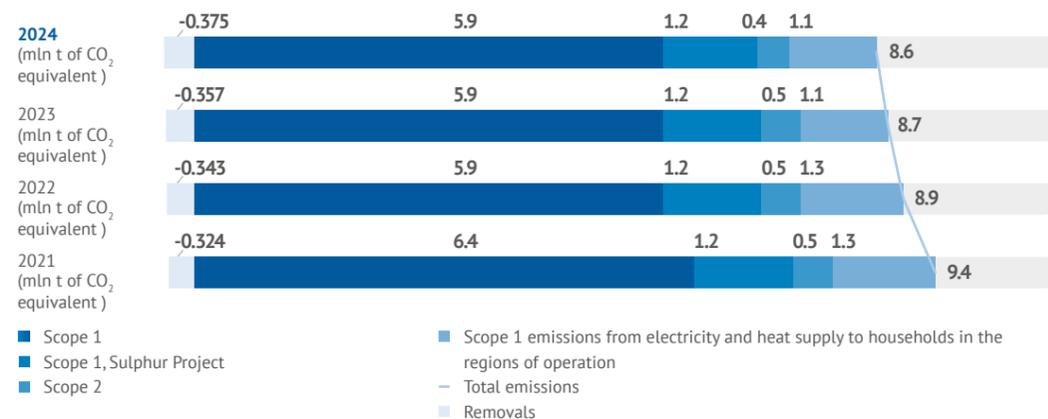
Greenhouse gas emissions and carbon footprint of products

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 (CO₂), nitrous oxide (N₂O), and methane (CH₄). 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 Plant¹.



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 CO₂ 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 CO₂ 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.

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

The intensity of GHG emissions (Scope 1 and 2) was 6.5 t of CO₂ equivalent per RUB 1 million of revenue under consolidated financial statement disclosures³.

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 CO₂ equivalent, including 8.2 mln t of direct emissions² 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 CO₂ 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 CO₂ equivalent in 2024.

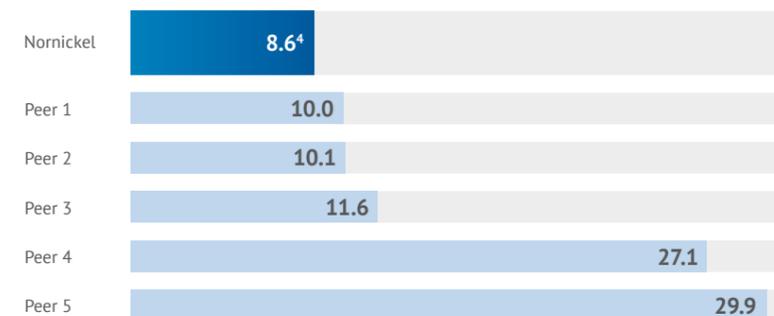


Emissions data verification by an independent auditor

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 CO₂ 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 CO₂ equivalent, including Scope 2 GHG emissions at 0.4 mln t of CO₂ 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.

GHG emissions (downstream and upstream Scope 3)

GRI 305-3 GRI 14.1.7

The Company conducts an annual quantification of Scope 3 emissions that arise outside of Norinickel Group's operations and are beyond its control. These emissions are categorised as upstream and downstream emissions.

Their quantification follows the recommendations of the GHG Protocol and the IPCC Guidelines for National Greenhouse Gas Inventories.

GHG emissions (Scope 3) (mln t of CO₂ equivalent)¹

Indicators	2022	2023	2024
Upstream, including	1.4	1.3	1.2
• purchased goods and services	0.9	0.8	0.7
• capital goods	0.1	0.1	0.1
• energy and fuel	0.3	0.3	0.3
• Other	0.1	0.1	0.1
Downstream, including	3.9	5.1	5.5
• transportation of sold products	0.2	0.2	0.2
• processing of sold products	3.7	4.9	5.3
Total Scope 3 emissions	5.3	6.4	6.7

In 2024, total upstream Scope 3 emissions amounted to

1.2
mln t of CO₂ equivalent

In 2024, the Company continued to report a quantitative assessment of upstream Scope 3 GHG emissions. Emissions are estimated across all categories of the GHG Protocol. The bulk of upstream Scope 3 emissions was attributable to the purchase of goods and equipment from third-party suppliers as well as to energy and fuel consumption (to the extent not included in Scope 1 and 2).

Downstream Scope 3 emissions are associated with the transportation of the Company's products from production assets to consumers and their subsequent processing into finished products.

To improve its Scope 3 emissions quantification methodology, the Company continuously monitors the evolving methodological framework, including international standards developed by ISO and the International Council on Mining and Metals (ICMM), industry associations, and engages with customers to obtain data on emissions released in the processing of sold products.

In 2024, the Company updated its methodology for quantifying other indirect (downstream Scope 3) GHG emissions, incorporating new guidance documents, such as the Scope 3 Emissions Accounting and Reporting Guidance (2023) by the International Council on Mining and Metals (ICMM), ISO 14083:2023, Global Logistics Emissions Council (GLEC) Framework, Scope 3 GHG Emissions in the Nickel Value Chains. A Guide to Determine Nickel-Specific Scope 3 GHG Emissions by the Nickel Institute, and industry best practices.

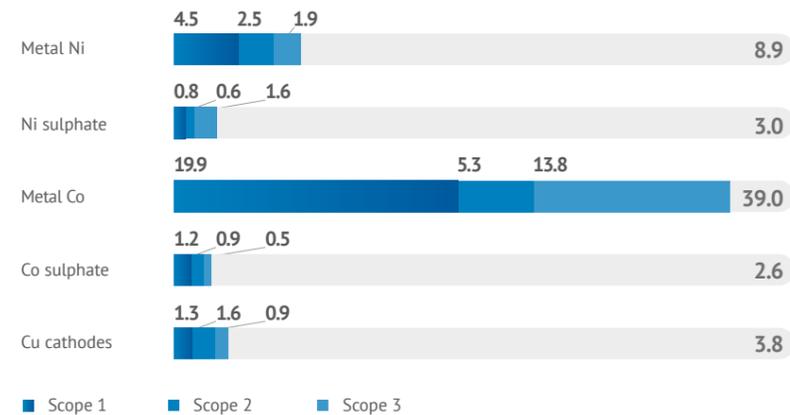
The downstream Scope 3 emissions assessment for 2024 covered nickel, copper, palladium, platinum, copper and nickel intermediates, and iron ore concentrate sold outside the Norinickel Group². The bulk of these emissions comes from intermediates sold outside the Group. Emission volumes are influenced by changes in sales volumes, the Group's product and customer portfolio, and the geographic mix of product sales.



Product carbon footprint

Product carbon footprint assessments for 2024³

Product carbon footprint of non-ferrous metals (kg of CO₂ equivalent per kg of product)



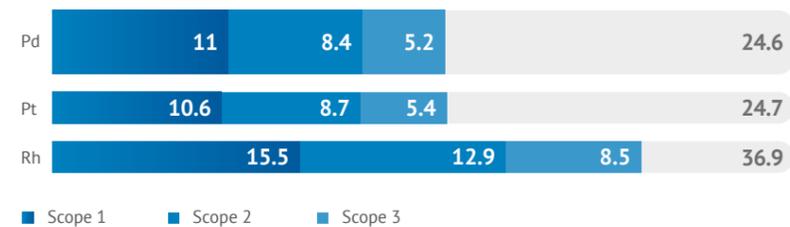
The carbon footprints of MMC Norilsk Nickel's products are calculated in accordance with:

- ISO 14067:2018, ISO 14040:2006, ISO 14044:2006
- GHG Protocol Product Life Cycle Accounting and Reporting Standard methodology
- LME passport guidance – Nickel Institute guidance for nickel producers to calculate their GHG emissions
- the IPA's guidance: The Carbon Footprint of Platinum Group Metals: A Best Practice Guidance for the Calculation of GHG of Primary Produced PGMs

The scope of the carbon footprint calculation for MMC Norilsk Nickel's products in 2024 included direct greenhouse gas absorption by tailings.

[For more details on this project, please see the Decarbonisation Projects sub-section.](#)

Product carbon footprint of PGMs (kg of CO₂ equivalent per g of metal)



¹ As part of its effort to standardise the approach to identifying GHG emissions sources, the Company reduced the uncertainty of calculating upstream Scope 3 emissions by excluding insignificant sources in the Purchased Goods and Services and Capital Goods categories from the calculation. As a result, the emissions data for 2022 have been restated using the new approach. In 2022, total restated emissions amounted to 1.4 mln t of CO₂ equivalent.

² Including foreign operations.

³ Including the Sulphur Project provision. Group data, including foreign companies of the Polar Division.

Energy consumption and energy efficiency

SASB EM-MM-130a.1

Operating in the Arctic zone, Norinickel places significant focus on developing its own energy infrastructure and improving the efficiency of energy use. Norinickel pursues an energy policy aimed at ensuring a reliable and uninterrupted

supply of clean energy to all stakeholders, while also contributing to the achievement of the goals of the [Energy Strategy of the Russian Federation until 2035](#).

Nornickel's priorities in energy

Nornickel's priorities in energy

Guaranteed energy security for the isolated Norilsk energy system

Transition to environmentally safe and resource-efficient energy

Sustainable use of natural resources and energy efficiency

Maximised use of equipment with verified Russian origin

More efficient management of energy facilities

Nornickel's key activities contributing to the goals of Russia's energy development strategy

Efficiently meeting the needs of the Russian Federation's social and economic development by ensuring adequate production and export volumes of goods and services from the fuel and energy sector

Spatial and regional development of the energy sector through transformation and optimisation of energy infrastructure in line with the evolution of domestic and global markets for energy products and services

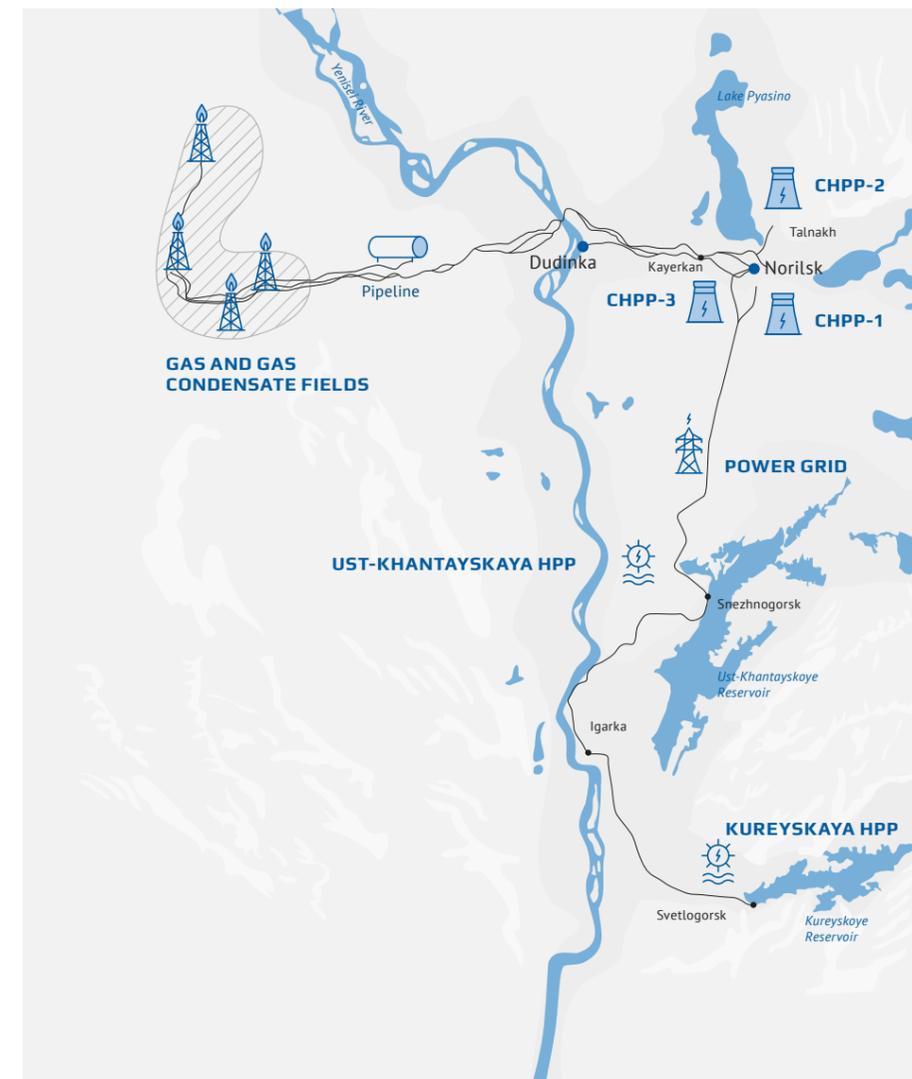
Achieving technological independence and enhancing competitiveness in the fuel and energy sector, meaning a sufficient level of in-house expertise and locally manufactured equipment to ensure stable operations and long-term development

Modernisation of the Energy Division's infrastructure

In the Norilsk Industrial District, the Company's enterprises comprising the Energy Division are the primary energy suppliers for both industrial operations and local communities. These energy facilities are located in the Norilsk District,

operating under the harsh natural and climatic conditions of the Arctic. For a brief overview of these assets, please see [Nornickel's 2023 Sustainability Report](#).

Modernisation of energy infrastructure facilities in 2024



To ensure uninterrupted supply of all types of energy to consumers in the Norilsk Industrial District and improve the performance of generating units at combined heat and power plants (CHP) plants and HPPs, as well as to reduce energy losses along the entire energy generation and distribution chain, Norinickel is renovating its generation fleet and energy grid infrastructure in 2024:

- A retrofitting project was completed for a gas pipeline's underwater crossing of the Bolshaya Kheta River
- Drilling operations continued on five wells at well pad No. 4 of the Pelyatkinskoye gas condensate field
- Pre-commissioning operations were organised at the booster compressor station of the Severo-Soleninskoye field
- Construction and installation activities were completed for the revamp of Unit No. 2 of CHPP-2
- The upgrade programme was continued for emergency diesel fuel tanks
- A CNG filling station was commissioned in Norilsk

MED-10, UNCTAD A.3.1

The total cost of CAPEX projects to expand electricity and heat generation capacity, as well as power grids and heat networks, amounted to RUB 4.7 billion in 2024.

Use of renewable energy sources

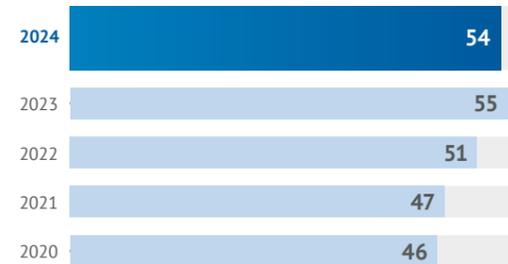
Nornickel considers renewable-energy projects as one of the avenues for achieving its climate goals. Given the extreme natural and climatic conditions at the Group's production sites, the use of solar, geothermal, and wind energy remains limited. However, the Company is exploring technological and organisational opportunities to install additional renewable energy capacity.

[For more details, please see the Nornickel's climate change strategy and projects sub-section.](#)

In the long term, the Company plans to build a balanced energy system based on a mix of nuclear, thermal, and hydro generation.

In 2024, the share of electricity generated from renewable sources reached 54.4% for the Group. This is slightly lower than in the previous year but exceeds the target of 46% set by the 2031 Environmental and Climate Change Strategy.

Share of renewables in total electricity consumption by Nornickel Group (%)



Total energy consumption by the Norilsk Nickel Group (TJ)

GRI 302-1, 302-3 / UNCTAD B.5.2 | GRI 14.1.2, 14.1.4

Indicators	2020	2021	2022	2023	2024
Fuel consumption	141,237	151,235	141,909	137,150	133,746
Self-generated energy from renewable sources (HPPs)	15,310	14,586	16,152	16,800	16,686
Electricity and heat purchased from third parties	11,200	10,891	11,005	8,701	8,660
Electricity and heat sales to third parties	17,254	19,974	18 968 ¹	19 216 ²	18 838 ³
Total energy consumption across the Group (1 + 2 + 3 - 4)	150,493	156,738	150,098	143,435	140,254
Energy intensity (GJ / RUB mln) ⁴	135	117	127	116	120

¹ Including 4,183 TJ of electricity and 14,785 TJ of heat.

² Including 4,203 TJ of electricity and 15,012 TJ of heat.

³ Including 4,108 TJ of electricity and 14,730 TJ of heat.

⁴ To calculate internal energy intensity, the Group's total energy consumption and revenue under consolidated financial statements were taken as the numerator and the denominator, respectively.

Fuel consumption by Group companies by type of fuel (TJ)

GRI 302-1 | GRI 14.1.2

Indicators	2020	2021	2022	2023	2024
Total fuel consumption	141,237	151,235	141,909	137,150	133,746
Natural gas	122,216	130,867	125,934	121,643	117,940
Coal ⁵	2,180	1,557	2,027	1,562	1,765
Diesel fuel and fuel oil	13 939 ⁶	15,097	13,623	13,080	13,471
Petrol and jet fuel	2,902	3,715	325	312	297
Lignite ⁷	–	–	–	552	273

Electricity and heat consumption by Group companies

GRI 302-1 / UNCTAD B.5.1 / MED-22 | GRI 14.1.2

Indicators	2022	2023	2024	Including in 2024	
				electricity	heating and steam
Electricity and heat consumption by the Group companies (TJ)	60,143	59,687	60,034	30,266	29,768
Including:					
• The Norilsk site's production enterprise (Talnakhskoye, Oktyabrskoye, Norilsk-1 deposits)	31,307	32,991	33,628	14,604	19,024
• The Energy Division's energy enterprise	6,045	5,907	6,003	4,032	1,971
• The Kola site's metals and mining enterprise	9,289	9,097	8,975	6,199	2,776
HPP share in total electricity consumption in the Norilsk Industrial District	56%	58%	58%	–	–
HPP share in total electricity consumption by the Company	51%	55%	54%	–	–
HPP share in total electricity and heat consumption by the Company	27%	28%	28%	–	–
Share of renewables in total electricity and fuel consumption	11%	12%	12%	–	–

⁵ The Company uses coal as a chemical feedstock in its production processes and does not use it for heating purposes.

⁶ Taking into account the diesel fuel lost irretrievably as a result of the CHPP-3 accident in May 2020.

⁷ The Company uses coal as a chemical feedstock in its production processes and does not use it for heating purposes.