

# Metal that blazes the trail

Copper for electronics

# Cu

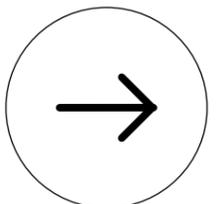
Copper was the first metal processed by humans, with smelting from ore beginning approximately six thousand years ago. Today, copper is the third most widely used metal, after iron and aluminium. Copper is often used in alloys, which offer greater strength and resistance than the pure metal.

In electronics, copper plays a crucial role as a conductor – primarily in wires, interconnects, microchips, and circuit boards. Copper is found in nearly all modern electronic devices. For example, a standard laptop contains 700 grams of copper.



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# President's letter

Dear shareholders,

Let me briefly summarise our performance in 2024 and outline Nornickel's near-term plans and priorities.

Sanctions pressure on our business, new financial infrastructure restrictions, and a continued low-price environment for nickel and palladium had a significant negative impact on our financial results.

Our revenue decreased 13% to USD 12.5 billion, while EBITDA was down 25% to USD 5.2 billion. In this context, Nornickel's management focused on operational measures to partially offset the impact of macroeconomic and geopolitical headwinds. Thanks to the record-fast completion of furnace repairs at Nadezhda Metallurgical Plant and the successful rollout of our operational efficiency programme, we exceeded our production guidance, maintaining metal output at near 2023 levels. Cost control efforts helped reduce cash operating costs by 3%, almost completely offsetting inflationary pressures. We also managed to reverse the negative, upward trend in working capital, which had been one of the biggest challenges over the past three years due to mounting sanctions pressure on Russian companies.

**” The Company continued to expand sales into new markets and launched production of premium nickel brands for the electroplating sector in China.**

The Company continued to expand sales into new markets and launched production of premium nickel brands for the electroplating sector in China. At the Kola site, the carbonyl nickel section was successfully brought back online following repairs, and the production of specialty nickel powders commenced. Additionally, we increased the share of premium copper cathodes to 84.3%. We stayed on track with our USD 2.4 billion investment programme, focusing on mining projects, debottlenecking in concentration and metallurgy, and, naturally, environmental protection. A major milestone in 2024 was the verification of the Sulphur Project's effectiveness at Nadezhda Metallurgical Plant, which has already reduced sulphur dioxide emissions in Norilsk by nearly 390 kt. The Sulphur

Project is aimed at dramatically reducing sulphur dioxide emissions in the Norilsk Industrial District and improving the quality of life for Norilsk residents. The Company has developed and launched an automated air quality monitoring system – one of the first such urban-focused projects in Russia providing real-time air monitoring.

Our top priorities include occupational health and safety as well as social stability. This commitment goes beyond safe operations – we are equally focused on creating conditions that foster productivity and providing opportunities for professional growth and development. In 2024, employee salaries were increased by 10% to reflect the cost-of-living adjustment. Between 2019 and 2024, total wage growth amounted

to 69%. We also extended our collective bargaining agreement for the 2024–2027 period, aligning the interests of both employees and the Company. This agreement remains one of the best in the industry, with Nornickel continuing to offer support well beyond statutory requirements.

We have successfully adapted to the challenges and constraints brought on by the discontinuation of equipment supplies from foreign vendors. Recently, we signed a partnership agreement to pursue a promising new line of business – the production of state-of-the-art mining equipment that meets the highest global standards. We launched the development of a mining equipment production facility in the Krasnoyarsk Territory, which will also offer repair services for the equipment produced.

Last year, we launched an operational efficiency programme covering all aspects of the Group's operations – from boosting labour productivity and ore output to improving recovery rates, enhancing finished product quality, and reducing both production and non-production costs. We are confident that its successful implementation will enhance the Company's resilience to external pressures and improve its financial performance over the coming years.

Managing debt amid limited capital market access and in an exceptionally high key rate environment warrants special mention. We continue to take a conservative approach to debt metrics, with a comfortable repayment schedule in place for our debt portfolio over the next few years and sufficient capital reserves

to meet all obligations – even in the event that new financing becomes completely unavailable.

In conclusion, I wish to reiterate our unwavering commitment to honouring all obligations to our employees and the state. In the face of ongoing commodity market volatility and elevated geopolitical risks, we believe that maintaining the Company's financial strength, improving operational efficiency, and investing in future markets and products serve the best interests of all our shareholders.

**Vladimir Potanin**  
 President,  
 MMC Norilsk Nickel



# Commodity markets

## Nickel market



### Key market trends

The nickel rally that started at the London Metal Exchange (LME) in late March was driven by delays in issuing nickel ore mining

permits in Indonesia, the LME's ban on Russian-origin nickel produced on or after 13 April 2024, the state of emergency in New Caledonia, and a broad-based price rally across all base metals, particularly in copper.

However, the price lost all the gains and declined to USD 17,000/t as early as June amid the announcements by the Indonesian government that additional nickel ore production

quotas had been issued, which triggered the liquidation of long speculative positions. Despite subsequent closures of production assets, including BHP's Nickel West in Australia and IGO's Forrestania, the bearish sentiment continued to dominate the LME trading, so the price plunged to USD 15,500/t by the end of July.

In September, the LME nickel price rebounded to USD 17,000/t as the US Federal Reserve System lowered interest rates by 50 b.p., exceeding market expectations, and the Russian authorities announced

potential restrictions on the exports of nickel in retaliation to Western sanctions. Later on, the People's Bank of China unveiled the most aggressive financial stimulus since the pandemic to achieve the government's growth target.

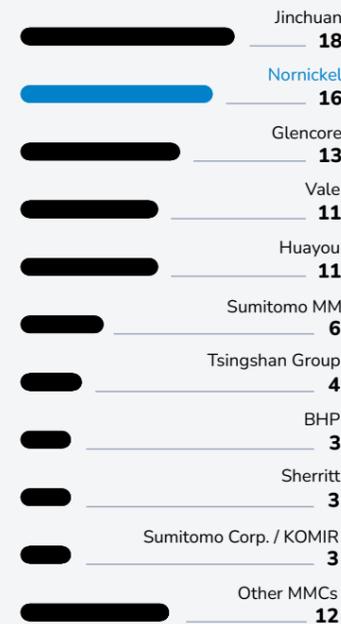
As a result, the price reached a three-month high of USD 18,000/t at the beginning of October as these measures significantly boosted market sentiment. Still, the price fell again after the Golden Week holiday as, after a more detailed look at the proposed stimulus package, the market found it insufficient.

By mid-November, the prices slumped to USD 15,300/t, despite news of Ambatovy's technical issues, Eramet's production cuts in Indonesia, and reports of curtailments by one of the largest Indonesian NPI producers due to tight nickel ore supplies. At year-end, the price fell below USD 15,000/t – its lowest level since 2020 – as it remained under pressure from weak market fundamentals.

As a result, the LME nickel price averaged USD 16,812/t in 2024, down 22% from the 2023 average of USD 21,474/t.

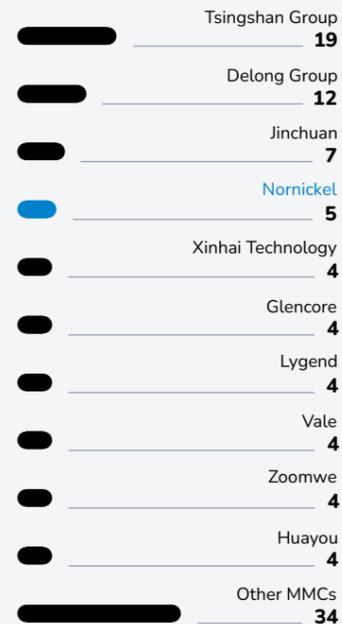
### World's largest Class 1 nickel producers in 2024 (%) Nornickel – No. 2

Sources: producer reports, Company analysis as of early March 2025



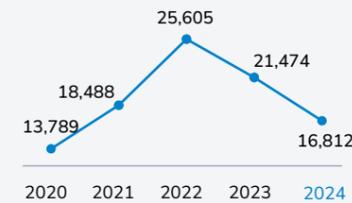
### World's largest primary nickel producers in 2024 (%) Nornickel – No. 4

Sources: producer reports, Company analysis as of early March 2025



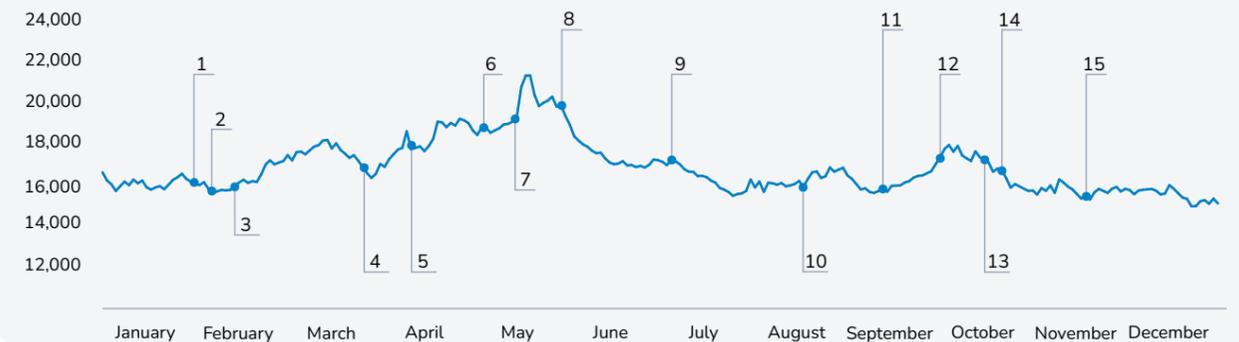
### LME nickel price in 2024 (USD/T)

Source: London Metal Exchange, Company analysis

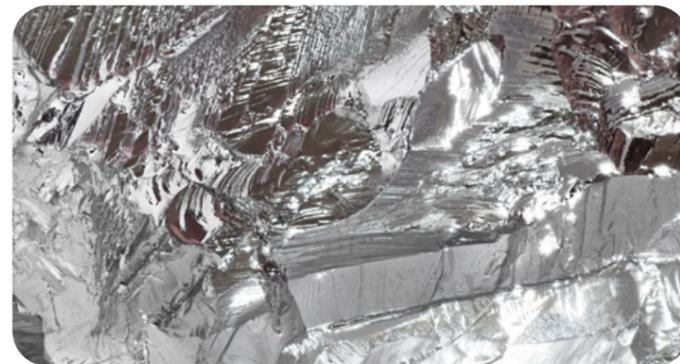


### LME nickel price in 2024 (USD/T)

Source: London Metal Exchange, Company analysis



1. New Caledonia's Prony Resources faces cash crunch.
2. BHP flags possible production cuts at Nickel West in Australia.
3. Glencore to exit Koniambo, to place plant into C&M.
4. Indonesia issues production quotas for 65% of annual nickel ore demand.
5. LME bans new Russian-origin metal.
6. First Quantum Minerals puts Ravensthorpe into C&M.
7. State of emergency in New Caledonia.
8. Indonesia issues production quotas for 85%–90% of annual nickel ore demand.
9. BHP to close Nickel West.
10. IGO puts Forrestania into C&M.
11. Russia considers export restrictions on nickel.
12. China's government unveils new economic stimulus package.
13. Eramet cuts Indonesia ore production on mining permit setbacks.
14. Ambatovy suspends nickel output.
15. Indonesia considers changes in nickel ore royalties.



## Market balance

In 2024, primary nickel demand increased by 4% y-o-y to 3.39 mln t on the back of higher use in the stainless steel (+4% y-o-y), special steel (+8% y-o-y), and alloys (+8% y-o-y) sectors due to a robust environment in the aerospace and oil and gas industries, while consumption in the battery sector fell short of expectations (+4% y-o-y) due to low sales of non-Chinese NEVs (new energy vehicles: battery electric vehicles and plug-in hybrids) and a higher share of nickel-free LFP batteries.

Refined nickel output grew by only 3% y-o-y to 3.54 mln t as higher Indonesian NPI (+9% y-o-y) and Class 1 (+15% y-o-y) production was offset by lower supply of Chinese NPI (-15% y-o-y), ferronickel (-24% y-o-y), and low production of nickel chemicals (+1% y-o-y) which turned out to be lower than expected due to slower EV sales and lower share of nickel-based battery chemistries in China.

As a result, in 2024, the global nickel market had a surplus of approximately 150 kt, or 5% of annual consumption (compared to a surplus of 183 kt in 2023). The surplus was mainly concentrated in China-origin high-grade nickel, accumulated in LME-approved warehouses in Asia and other off-warrant inventories.

Overall, around half of all nickel producers were loss-making in the end of 2024, as surging Indonesian supply is weighing on high-cost operations all over the globe, predominantly in Australia and New Caledonia, which could be a potential upside for the nickel price. Considering the scale of potential supply curtailments in Indonesia and elsewhere, as well as the robustness of nickel use in the stainless steel, alloys, and special steel sectors, the market may become more balanced going forward.

## Demand

**The largest nickel-consuming countries are China, Indonesia, EU member states, Japan, the USA, and South Korea.**

Stainless steel remained the key sector of primary nickel use in 2024 (about 65% of total demand).

Stainless steel production uses almost all types of nickel feed (except for certain special products, such as nickel powder and compounds). However, since the quality of nickel used has almost

no effect on stainless steel quality, steelmakers primarily use cheaper low-grade nickel such as NPI, ferronickel, and nickel oxide. As a result, the share of high-grade nickel used in stainless steel has decreased in recent years.

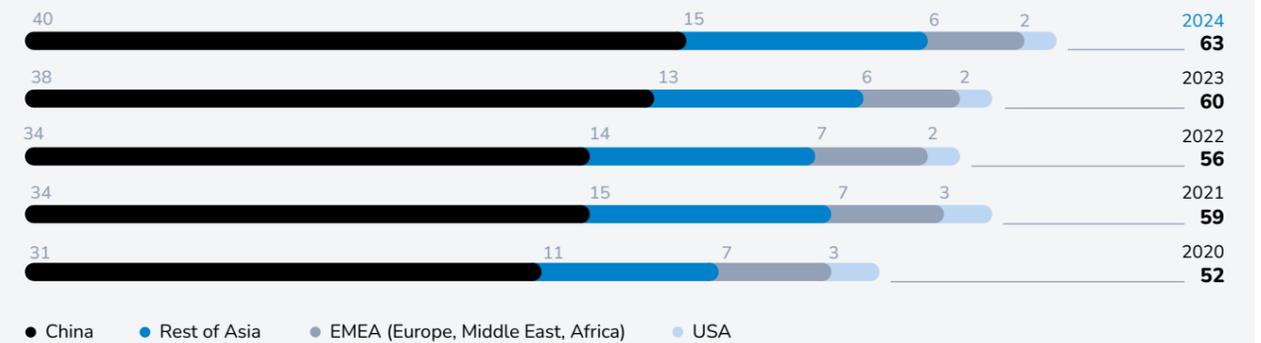
In 2024, global stainless steel production rose by 5% y-o-y to 63 mln t, driven by output

growth in China (+4% y-o-y) and the rest of Asia (+9% y-o-y) amid a recovery in Indonesian production and new capacity additions in India. Meanwhile, stainless steel output in Europe grew by just 2% y-o-y due to destocking, operational issues at multiple facilities, and weak consumer demand. Stainless steel production in the Americas rose 3% y-o-y, also pressured by uncertainty in end-user demand.

**The battery industry** uses nickel as a key element in the production of precursor cathode active materials for batteries. In 2024, nickel use in the battery sector increased by only 4% to 0.5 mln t amid a slowdown in BEV sales and a surge in sales of plug-in hybrid electric vehicles (PHEVs), which have lower battery capacity and thus lower nickel content, as well as a growing share of nickel-free LFP batteries.

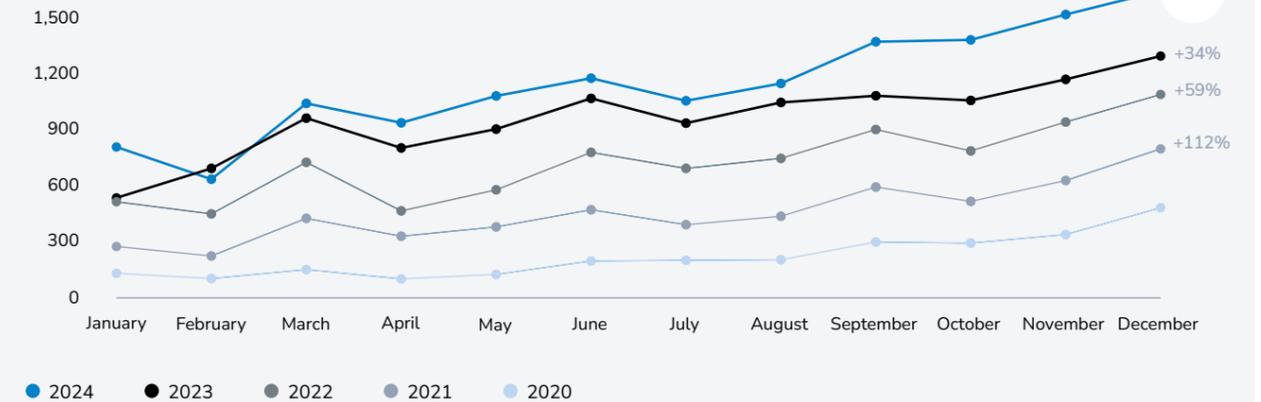
### Stainless steel production (MLN T<sup>1</sup>)

Sources: Eurofer, ISSF, USGS, SMR, METI, TSIA, Company data



### Global sales of electric vehicles (THOUSAND UNITS)

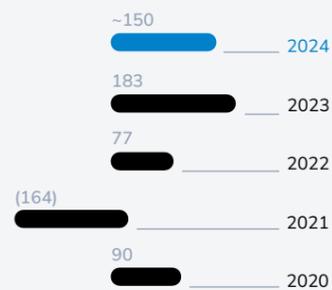
Sources: SNE Research, Company analysis



<sup>1</sup> Figures may not sum up due to rounding.

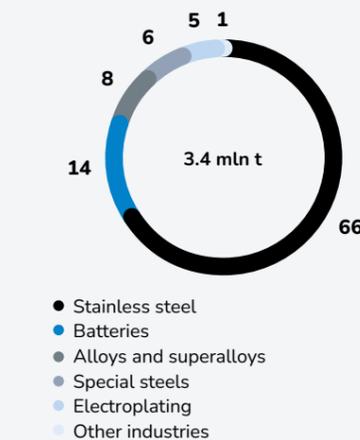
### Nickel supply and demand balance, excluding changes in current reserves (KT)

Source: Company estimate as of March 2025



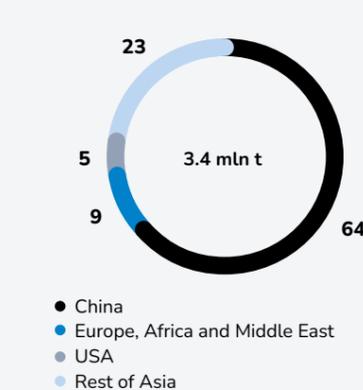
### Primary nickel consumption by industry in 2024 (%)

Source: Company data



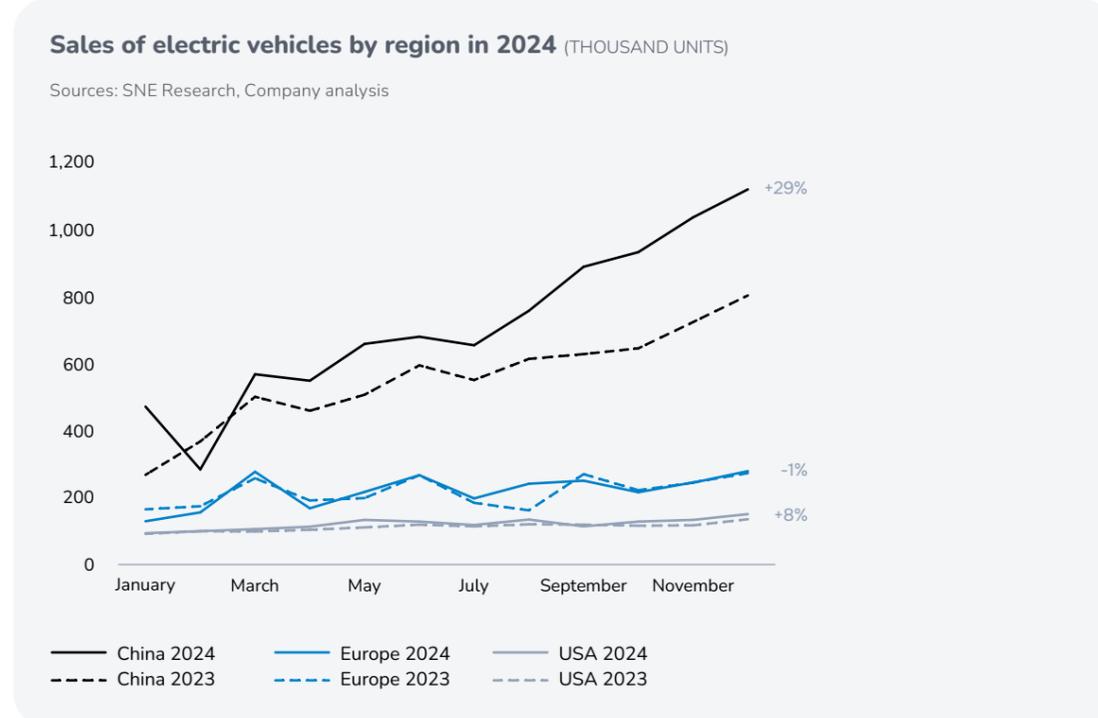
### Primary nickel consumption by region in 2024 (%)

Source: Company data

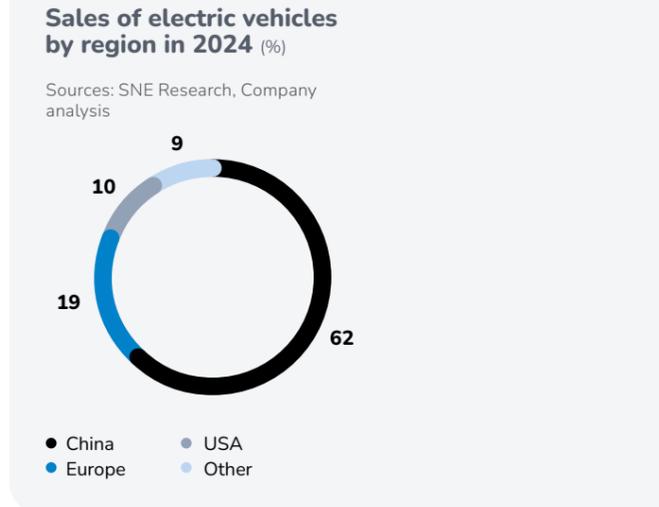


In 2024, global BEV-equivalent sales<sup>1</sup> grew 20% y-o-y. Sales in China jumped by 29% y-o-y, primarily driven by rising PHEV sales, which surged by 79% y-o-y, while the growth rate of BEV sales was materially smaller (+21% y-o-y). In 2024, NEV sales in China reached a record penetration rate of 48%, being almost on par with internal combustion engine (ICE) vehicles, prompted by the intensive rollout of new models by domestic automakers as well as state support. For example, the Chinese government continued to promote vehicle trade-in subsidies during the year by doubling the cash handout for consumers who replace their ICE cars or old EVs with a new NEV.

However, as some metrics suggest, the domestic market might have reached a state of saturation given the intensifying competition, so China turned its attention to foreign markets by raising its vehicle exports from 500 thousand units in the 2010s to 6.4 million in 2024, over 20% of which were NEVs. We expect this trend to continue in the medium term as Chinese OEMs are likely to boost low-cost EV exports to developing economies, including Southeast Asia, the Middle East, and Latin America.



In Europe, 2024 recorded a remarkable deceleration in electric vehicle adoption efforts. European BEV-equivalent sales declined by 1% y-o-y due to a withdrawal of policy support in some countries (notably in Germany and France) and lower affordability of EVs for consumers as the ICE counterparts remain more price competitive.



Moreover, companies like Northvolt, which have long been considered the backbone of Europe's battery sector, filed for bankruptcy as they struggled to compete with Asian producers. They are also grappling with an unexpected drop in demand for electric vehicles, which points to an uncertain future.

In 2024, the European Union imposed tariffs on Chinese-made EVs as the concerns about unfair trade practices and the impact of Chinese subsidies on the EU market grew. These tariffs, which could range from 17% to 35% depending on the manufacturer, were implemented on 31 October 2024. We expect this decision to constrain European EV sales even more, which will have a negative impact on the EU transport electrification plans in the medium term.

The US EV market was sending similarly mixed signals throughout the year, with growth continuing, but slower than previously anticipated (+8% y-o-y).

After Trump's re-election, there have been some developments regarding the future of the Inflation Reduction Act (IRA) and the US electric vehicle sector. Trump has declared his intention to roll back significant portions of the IRA, particularly focusing on unspent funds. His

administration may also reduce and divert some of the funding planned for similar projects and EV adoption incentives. However, certain aspects of the IRA, especially those supporting US-based manufacturing of EVs, could be preserved, as some Republicans recognise the value of fostering local production.

The overall growing popularity of electric and hybrid cars, along with the evolution of cathode technology towards nickel-intensive types, adds to the tailwinds for significant growth in primary nickel demand in batteries in the long run. Despite the mounting competition across technologies, high-nickel formulations will remain the preferred option for automakers owing to their higher energy density, longer range, and better recyclability. Meanwhile, this figure may require further upward revisions given the continuous introduction of more ambitious carbon neutrality goals, subsidies-driven transport electrification, and cost optimisation of battery cell production.

In 2024, nickel use in **other industries** (alloys, special steels, plating, etc.) increased by 6%, or 0.7 mln t, amid the steady recovery in industrial demand and robust economic performance in the aerospace and oil and gas sectors.

## Supply

High-grade nickel is produced in the form of nickel cathodes, briquettes, pellets and powder, rounds, and other small special forms as well as chemical compounds, both from sulphide and from more common and available laterite raw materials. In 2024, the leading producers of high-grade nickel were Jinchuan, Nor Nickel, Huayou, Glencore, Vale, Zoomwe, and Sumitomo Metal Mining (SMM).

Low-grade nickel includes nickel pig iron, ferronickel, nickel oxide and utility nickel, which are produced from laterite raw materials only. In 2024, the key producers of low-grade nickel were Indonesian and Chinese NPI smelters, owned by Tsingshan and Delong, as well as the largest ferronickel producers: South32, Anglo American, POSCO, Eramet, etc.

The nickel market had been fundamentally divided into the low-grade and high-grade segments. However, these markets became interconnected once the practical implementation of the NPI-to-matte conversion started in early 2021 along with the massive HPAL<sup>1</sup> capacity additions, and the launch of nickel cathode production from low-grade Indonesian feed sources in 2023.

<sup>1</sup> Under this methodology, HEV and PHEV are recalculated according to their relative battery capacity ratio: HEV 2 kWh vs PHEV 20 kWh vs BEV 60 kWh.

<sup>1</sup> High pressure acid leaching processes.

Refined nickel production increased by 3% y-o-y to 3.5 mln t in 2024, according to our estimates.

Supply growth in 2024 was mainly driven by the ongoing expansion of Indonesian NPI and HPAL intermediates projects as well as increased production of nickel cathodes in China and Indonesia from Indonesian materials. On the other hand, this growth was offset by a decline in Chinese NPI output, global FeNi and non-Chinese Class 1 production cutbacks as well as a slowdown in global nickel compounds output.

At the same time, potential production curtailments due to an unstable price environment and operational challenges faced by many producers could serve as a balancing factor in the oversupplied market, as around half of all nickel producers are loss-making at the 2024-end price.

**Production of high-grade nickel** grew 11% to 1.4 mln t in 2024.

**Class 1 nickel output** grew by 15% y-o-y to 1 mln t, surpassing both the absolute and relative growth rates of NPI production for the first time in a long while. Class 1 nickel production was steadily growing, mainly due to the launch of new nickel cathode capacities in China and Indonesia.

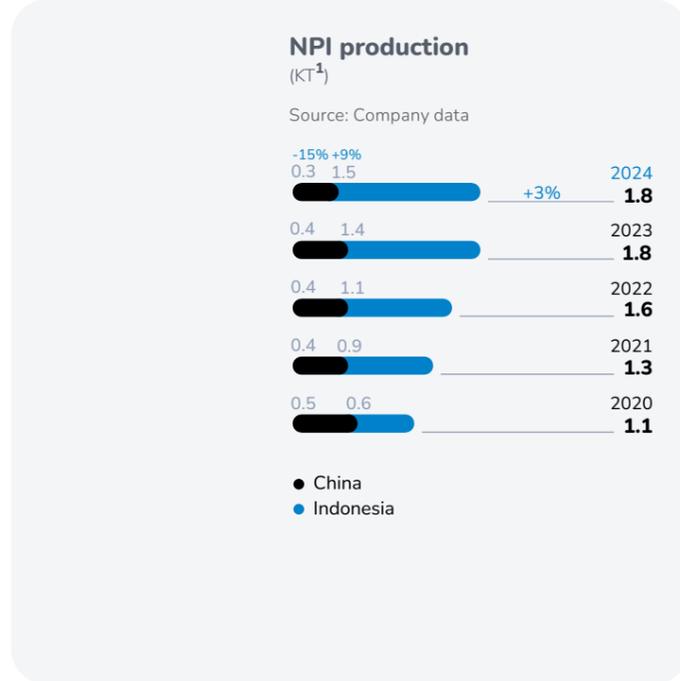
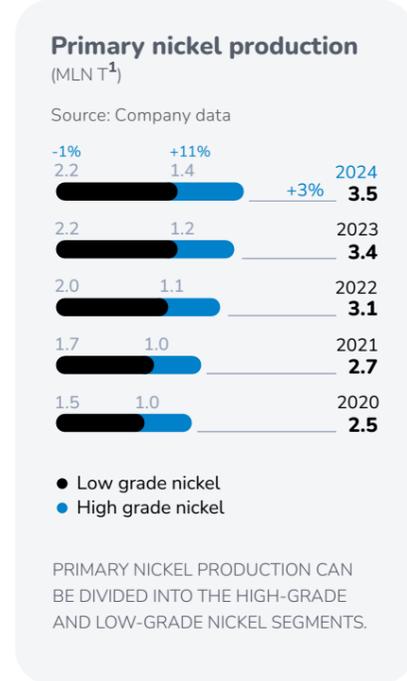
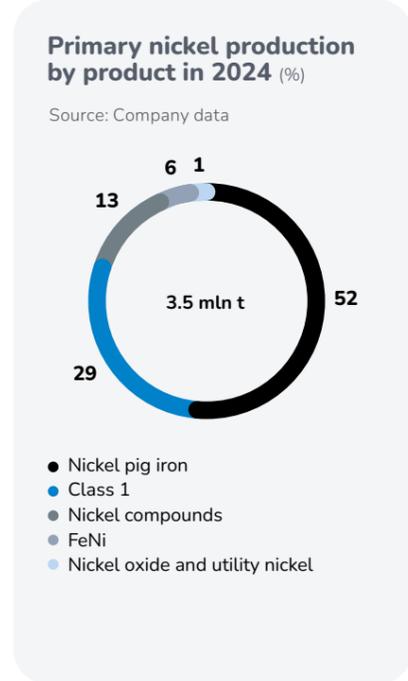
On top of this, Class 1 nickel production grew in Japan (driven by higher converter matte exports from Indonesia), South Africa (due to a release of built-up work-in-progress inventory at Anglo American Platinum), and Norway (as Glencore ramped up to design capacity following supply chain disruptions caused by strikes in 2022). However, output declined in Australia (due to the shutdown and subsequent mothballing of BHP's operations) and Madagascar (due to persistent operational difficulties and high production costs).

Nornickel slightly reduced its nickel output in 2024 due to the full overhaul and subsequent ramp-up of flash smelting furnace No. 2

(FSF-2) in the second half of 2024. Despite this, nickel output exceeded the Company's full-year production guidance.

During the year, **production of nickel compounds**, including nickel sulphate from primary sources (excluding sulphate produced by Class 1 nickel dissolution), increased only marginally by 1% y-o-y. This was largely due to lower demand from the battery sector amid slowing EV sales and a declining share of nickel-containing batteries as well as a shift from nickel sulphate to Class 1 production in China and supply reductions by a number of Western producers.

**Low-grade nickel output** declined by 1% y-o-y to 2.2 mln t.



Indonesia continued to grow its NPI production capacities. Since 2015, Indonesia's NPI output had been steadily increasing at double-digit rates annually. However, 2024 marked a shift in this trend as growth slowed to 9% y-o-y over 12M 2024 amid delays in issuing new nickel ore mining quotas, which began to emerge in the second half of 2023.

In addition to restricted ore availability, producers are facing declining nickel grades as high-grade ore reserves in the country are being rapidly depleted. This trend is evident in the decreasing nickel content of Indonesia's exported NPI. As a result, consumers are forced to rely on ores with high Mg and Si content, which presents additional metallurgical complexities. To mitigate these issues, nickel ore imports from the Philippines have been significantly increased in order to use those for blending purposes.

As a result, Indonesia's NPI output was 1.5 mln t in 2024.

**China's NPI production** continued to decline in 2024, falling by 15% y-o-y to 0.3 mln t, due to increased competition from cheaper Indonesian NPI and the fact that most producers were operating at negative margins.

In 2024, **ferronickel output** continued to decline rapidly, falling to 0.2 mln t of nickel (down 24% y-o-y). The primary factors behind the decrease are the continuing negative price dynamics (FeNi is traded at a discount to the LME nickel price), high production costs, and low capacity utilisation rates shown by multiple major producers. For instance, there were production shutdowns across several sites, including facilities in New Caledonia, North Macedonia, Serbia, and the Dominican Republic. Technical, operational, and financial difficulties were also observed at projects in Japan, Myanmar, and Brazil.

<sup>1</sup> Figures may not sum up due to rounding.

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# Copper market

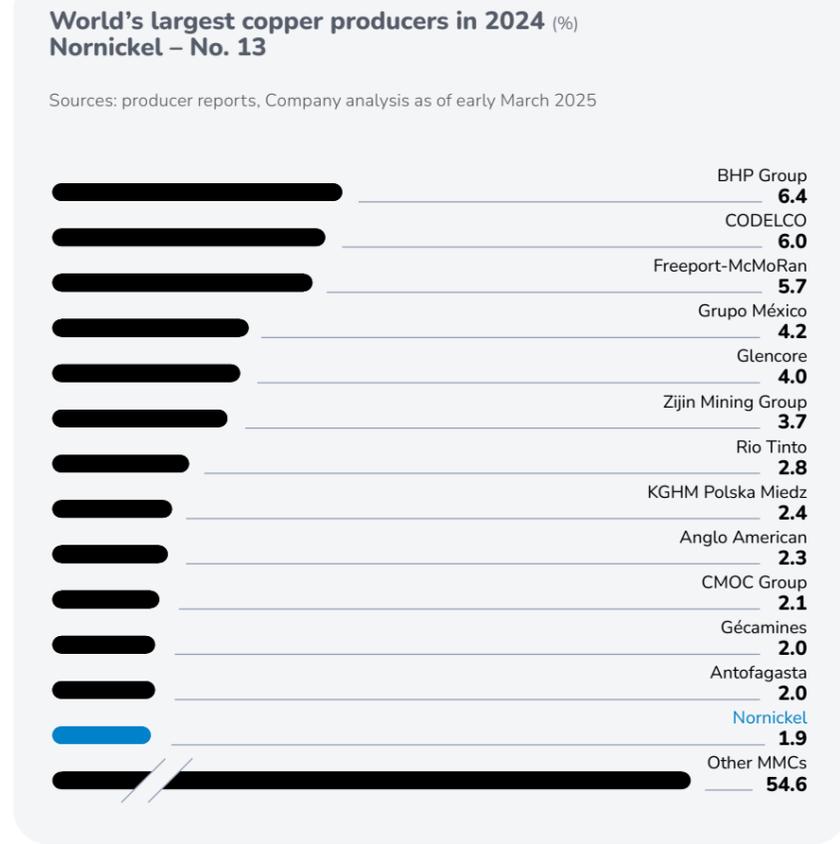


## Key market trends

In 2024, copper demand showed a positive trend, rising to 26.4 mln t, up 3% y-o-y, on the back of electricity grid expansion drive, the development of renewable projects, and the continued push for transport electrification. The start of monetary policy easing in the world's major economies also generally supported industrial production and associated copper consumption.

At the same time, demand growth was weaker than previously expected due to a slowdown in the global economy, primarily in China – the world's largest copper consumer. Total exchange inventories on the LME, SHFE, and CME jumped 103% to 432 kt, while bonded stocks in China surged 136% from the start of the year, reaching 19 kt.

During the year, copper prices showed positive trends, remaining within the USD 8,100–10,800/t range. The price hit a record high in May amid market concerns over concentrate shortages caused by the shutdown of the Cobre Panama mine due to local protests as well as Anglo American's reduced production plans and Vale's operational difficulties. These factors put significant downward pressure



on copper concentrate TC/RC rates, prompting Chinese smelters and refiners to revise their production plans and increasing the risk of refined copper shortages. This,

combined with increased investor activity, drove prices to a record high of USD 10,860/t at the end of May.

Towards mid-year, the market trend reversed. Weaker-than-expected demand growth, mixed economic signals from China, and a rise in exchange inventories to multi-year highs negatively impacted the metal price, driving it down to USD 8,600/t in early August. By September, the price had recovered to USD 9,800/t on the back of lower interest rates in the USA, an economic stimulus package announced by the Chinese government, and a decline in global exchange inventories.

However, market optimism had waned by October as participants changed their views about the effectiveness of the Chinese government's economic stimulus package in bolstering industrial demand. As a result, prices followed a downward trend for the remainder of the year, hitting USD 8,700/t in December.

In 2024, the LME copper price averaged at USD 9,147/t vs USD 8,478/t in 2023 (+8%).



## Market balance

In 2024, copper mine output increased by 2% to 22.9 mln t, and refined copper production by 3% to 26.6 mln t. Global refined copper consumption totalled 26.4 mln t, up 3%. Overall, the copper market was balanced in 2024, with a statistical surplus of 0.2 mln t, or less than 1% of global consumption.

## Demand

In 2024, global refined copper consumption totalled 26.4 mln t, up 3% y-o-y.

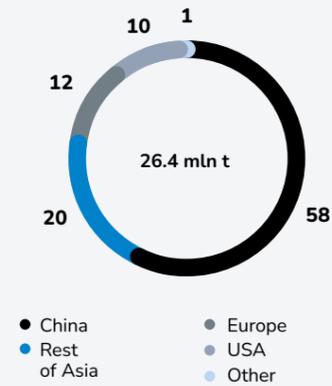
China demonstrated positive growth momentum in consumption, increasing it by 4% to 15.3 mln t.

Despite the government's aggressive stimulus efforts, demand growth was weaker than expected due to the ongoing construction crisis and mixed macroeconomic data in the country. Imports of refined copper to China increased 7% y-o-y to 3.8 mln t, while imports of scrap and concentrates grew 13% and 2% to 2.2 mln t and 28.2 mln t, respectively.

In Europe, consumption slightly declined by 1% to 3.1 mln t, while North America showed a positive trend with a 2% increase to 2.2 mln t. Consumption in Asia (excluding China) also grew by 2%, reaching 5.3 mln t. In Russia, apparent primary copper consumption is estimated at 360 kt.

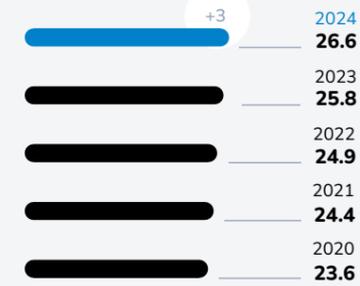
### Refined copper consumption by region in 2024 (%)

Sources: Company data, CRU



### Production of refined copper (MLN T)

Sources: Company data, CRU



### Refined copper market balance (MLN T)

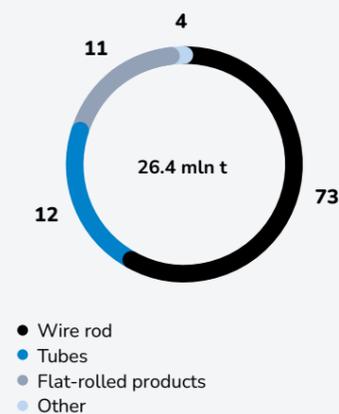
Source: Company analysis as of February 2025



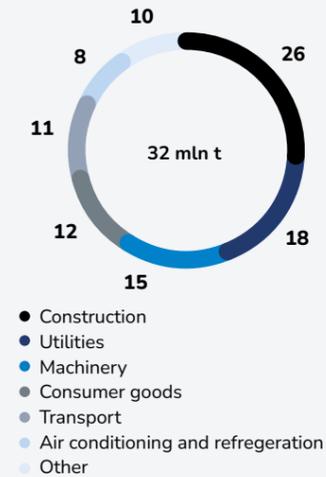
### Refined copper consumption by industry in 2024 (%)

Sources: Company data, CRU

First use



End use



## Supply

Global copper production increased by 2% to 22.9 mln t driven by the launch of new and expansion of existing projects.

Chile, the world's top copper producer, increased mine output by 3% to 5.4 mln t in 2024, while Peru's output fell 2% y-o-y to 2.7 mln t.

Africa managed to increase production by 9% to 4.1 mln t, with the Democratic Republic of the Congo (DRC) contributing most of the growth through Ivanhoe's Kamoakakula project and overtaking Peru to become the world's second-largest copper producer.

China increased its copper-in-concentrate production by 2% to 1.9 mln t, while Indonesia's copper mine output rose to 1.1 mln t, up 13% y-o-y.

In North America, mined production of copper declined by 4% to 2.2 mln t. In the USA, output fell by 5% to 1.1 mln t; in Canada, by 3% to 400 kt; and in Mexico, by 2% to 0.7 mln t.

Refined copper production grew 3% y-o-y to 26.6 mln t amid new capacity launches in China. In South and Central America, copper cathode output fell by 6% to 2.4 mln t, with Chile recording the largest decline in refined copper production. Africa saw a 9% increase in production to 2.6 mln t, while Asia (including China) ramped up its output by 5% to 16.3 mln t. China's refined copper output increased by 9% to 12 mln t, while in Japan it decreased marginally by 1% to 1.5 mln t. Production in Europe was flat year-on-year at 3.5 mln t, while copper output in North America increased by 2% to 1.5 mln t.

**The world's largest copper mining countries are Chile, Peru, the Democratic Republic of the Congo, China, and the USA.**



# PGM market

## Key market trends

### Palladium

The palladium price moved predominantly within the USD 900–1,100/oz range during the year. In summer, it hit a low of USD 858/oz, pressured by unprecedentedly large short speculative positions on the exchanges and lower metal inventories at automakers and autocatalyst producers. In October, the price responded to a sharp reduction in short speculative positions and a request by US administration officials for G7 members to consider an import ban on Russian palladium and titanium, pushing it to USD 1,232/oz for the first time in 2024.

The PGM basket price found its strong fundamental support as half of South African PGM mines are unprofitable at the current prices. No project closures were announced in 2024 as almost all PGM producers had sufficient financial resources and were able to cross-subsidise. However, Sibanye-Stillwater announced plans to cut production at its high-cost

Stillwater mine in the USA starting from 2025. Price increases are limited by the significant volumes of spent autocatalyst scrap hoarded by recyclers, which can be released once more favourable price levels are reached.

The average annual price of palladium fell by 26% y-o-y to USD 984/oz in 2024.

### Platinum

Throughout in 2024, the platinum price remained within the USD 900–1,100/oz range. A rally in the gold market, mainly driven by central bank purchases, dragged along silver but had no effect on platinum prices. This was largely due to market optimism about continued growth in industrial

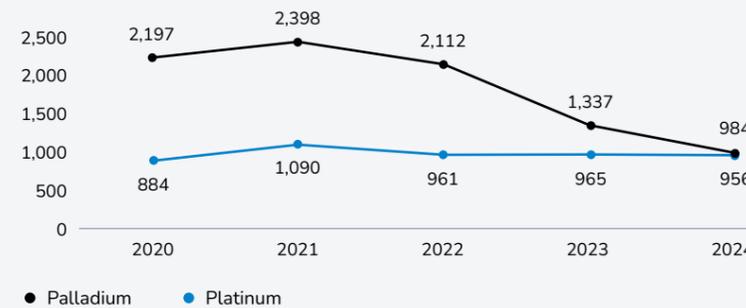
demand for silver, while expectations for platinum consumption growth were more subdued amid a slowdown in the rollout of hydrogen technologies.

Shrinking margins of South African PGM mines and the possibility of price-elastic palladium-for-platinum substitution in certain industrial applications put a cap on both upside and downside platinum price movements.

The average annual price of platinum fell by 1% y-o-y to USD 956/oz in 2024.

Average annual PGM prices (USD/OZ)

Source: Company analysis



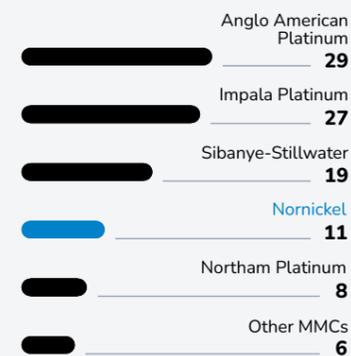
World's largest palladium producers in 2024 (%)<sup>1</sup>

#### Nornickel – No. 1



World's largest platinum producers in 2024 (%)<sup>1</sup>

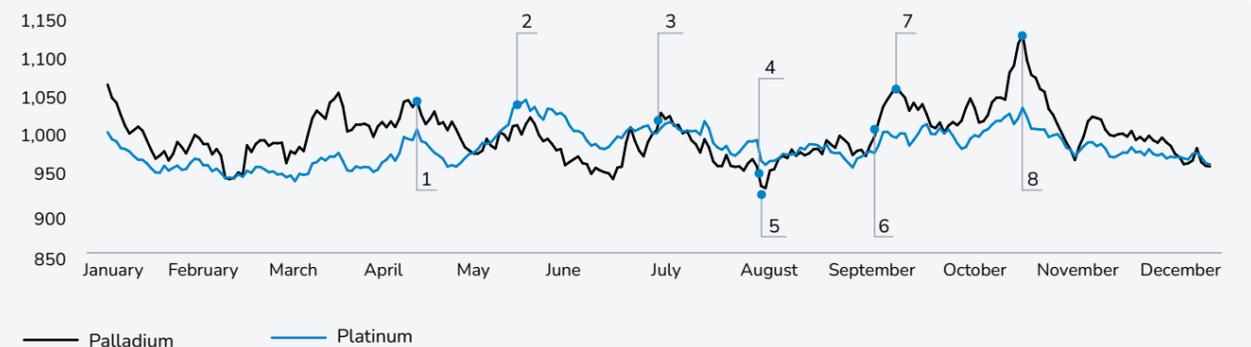
#### Nornickel – No. 4



PGM consumption by region in 2024 (%)



Palladium and platinum prices in 2024 (LPPM)



1. The anticipation of mine supply cuts in the South African PGM mining industry drives platinum's price to a nearly 12-month high.
2. A pro-business coalition government is formed in South Africa, strengthening the South African rand, which increases MPG production costs in dollars and supports PGM prices.
3. Lack of spot metal availability, growth of palladium leasing companies coupled with an upcoming NYMEX futures rolling.
4. Rising US recession fears.
5. China's net imports of palladium plunge to the lowest monthly level since August 2023.
6. Russian President Vladimir Putin raises an issue of possible uranium, titanium, and nickel export restrictions, which increases the fear of palladium being drawn into the discussion too.
7. Sibanye-Stillwater to halve PGM production at its Stillwater mine in 2025.
8. Reports of US administration officials asking G7 members to consider an import ban on Russian palladium and titanium. Palladium short positions on NYMEX shrink drastically.

<sup>1</sup> Refined metal output including production from third-party feedstock and production from own feedstock by third parties under tolling agreements. Sources: producer reports, Company analysis as of early March 2025.

## Market balance

In 2024, the palladium market moved from a deficit to balance amid an accelerated decline in demand relative to supply. Demand was under pressure mainly due to PGM thrifting programmes in autocatalyst production in China, Japan, and the USA. The overall weak performance in the automotive industry, along with ongoing – albeit slowing – transport electrification, also took their toll. At the same time, the decline in metal supply was less pronounced, primarily due to reduced recycling volumes, while primary production remained stable: lower metal mining in North America and South Africa was offset by higher output in Russia.

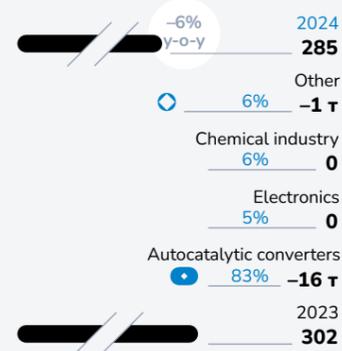
The platinum market was nearly balanced amid stagnation in both supply and demand. Metal consumption was under pressure due to stagnant auto production, a declining market share of diesel vehicles coupled with lower overall PGM loadings per vehicle, and weakening demand for jewellery.

## Demand

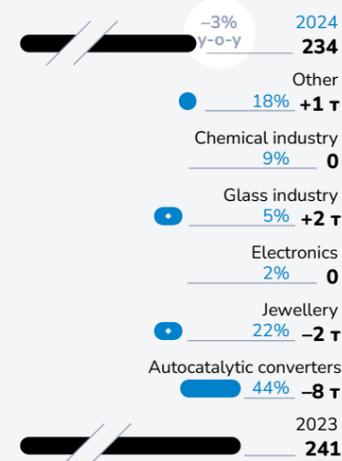
In 2024, industrial consumption of palladium declined by 17 tonnes (down 6%) y-o-y to 285 tonnes, while industrial demand for platinum decreased by 6 tonnes (down 3%) to 234 tonnes.

**Automotive industry.** Exhaust treatment systems account for the bulk of total PGM consumption. In this sector, palladium and platinum are used in catalytic converters, which are mandatory for road transport and legally

### Palladium: consumption by industry (%) and by application (T) in 2024



### Platinum: consumption by industry (%) and by application (T) in 2024



regulated in most countries. These solutions drastically reduce emissions of hazardous substances.

Due to their unique catalytic properties ensuring effective chemical reactions throughout the entire vehicle life cycle, there are almost no alternatives to PGMs in this sector.

ICE-powered vehicles continue to account for 85% of production, while all-electric vehicles make up only 15% of total vehicle output. That said, the trend throughout 2024 was that transport electrification was driven primarily by hybrids rather than all-electric vehicles, which do not use catalytic converters. Sales of all-electric vehicles increased by only 15% compared to an increase of over 20% for plug-in hybrids.

**The main consumers of PGMs are China, EU countries, Japan, and the USA.**

In addition, 2024 saw a softening of transport electrification policies as the new US administration took office and tax credits for EV purchases were scrapped in Europe.

Palladium consumption by the industry was down by 16 tonnes to 233 tonnes, while platinum use also fell, down 8 tonnes to 98 tonnes.



Despite manufacturers' efforts to optimise the use of precious metals in electronics, market growth has been strong enough to support steady consumption volumes.

**Electronics.** Palladium has found its way into the electronics industry primarily as a material for capacitors and motherboards, while platinum is used in hard drives. In 2024, palladium consumption in the electronics industry increased slightly to 16 tonnes on the back of stronger sales of household appliances. Platinum demand from the industry stayed flat at 5 tonnes.

**Chemical industry.** Platinum use in chemical catalysts rose slightly to 21 tonnes in 2024, while palladium consumption also increased, reaching 19 tonnes. The key drivers of consumption were capacity additions for the production of pyroxene (using platinum-based catalysts) and purified terephthalic acid (using palladium-based catalysts) in China.

**Healthcare.** Palladium consumption in this industry declined by 1 tonne to 5 tonnes, driven by a shift to alternative materials in dental prosthetics, primarily in Japan. Platinum consumption in this sector increased by 1 tonne to 9 tonnes on the back of growth in the usage of platinum-based medical devices, including platinum-based pacemakers, stents, implants, and cancer medicines.

**Jewellery.** Platinum demand in China – the world’s largest platinum jewellery market – declined as consumers shifted towards gold amid rising gold prices and limited marketing support for platinum jewellery sales. At the same time, slowing inflation and consequent lower interest rates in Europe and the USA support jewellery demand in developed economies, which partially offsets negative trends in the Chinese market. Platinum

use in jewellery decreased by 2 tonnes to 52 tonnes in 2024, while palladium consumption in the industry remained unchanged at 5 tonnes.

**Glass industry.** Bushings are platinum components used in the production of various types of glass products, including fiberglass and optical glass. Platinum demand in this industry increased by 2 tonnes to 14 tonnes in 2024, driven by both the growth

in fiberglass production and the substitution of rhodium with platinum in these applications.

**Investments.** Palladium and platinum are widely used as an investment instrument. Physical investments may vary from coins and smaller bars to investments in ETFs. Palladium stocks in ETFs increased by 8.2 tonnes to 24.4 tonnes in 2024, while platinum stocks also grew by 7.7 tonnes to 103.2 tonnes.

## Supply

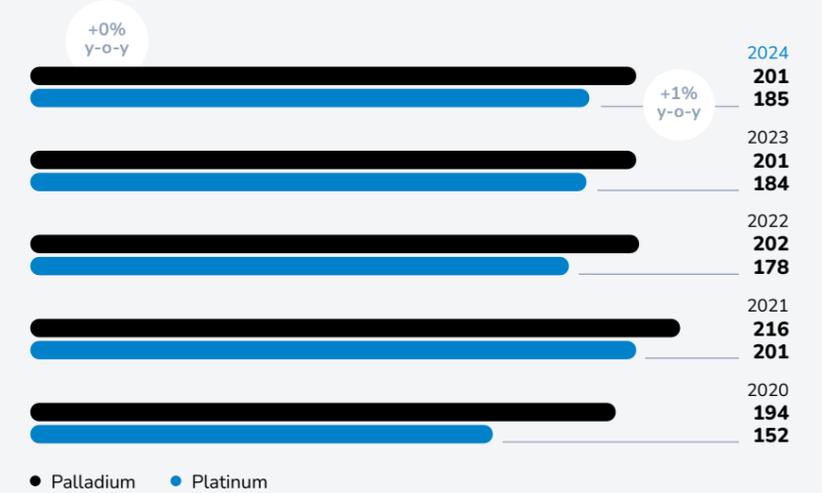
In 2024, primary refined palladium production remained unchanged from the prior year at 201 tonnes, while platinum output grew by 1% to 185 tonnes.

In Russia, the world’s leading palladium producer, Nornickel completed repair work on Nadezhda Metallurgical Plant’s flash smelting furnace No. 2 (FSF-2) ahead of schedule in the third quarter of 2024, increasing its throughput by 25% and exceeding production targets.

In South Africa, the world’s largest producer of platinum, a drop in metal mining production was offset by a decline in work-in-process inventories. As a result, palladium and platinum production was flat at 75 and 133 tonnes, respectively.

### Primary PGM production (T)

Source: Company data



Similarly, Zimbabwe’s primary palladium and platinum output in 2024 remained almost unchanged from the previous year, totalling 13 and 18 tonnes, respectively.

Palladium production in North America rose by 1 tonne to 27 tonnes, while platinum output was flat at 9 tonnes. The recovery in production came on the back

of a low base in 2023, when the Stillwater mine experienced technical difficulties.

The main sources of secondary PGM supply are spent automotive exhaust catalysts as well as recycled jewellery and electronic devices.

In 2024, recycled palladium and platinum production decreased by 4 tonnes and 2 tonnes to 83 tonnes and 44 tonnes, respectively. This marked decline in recycling volumes was driven by higher interest rates, which led consumers to postpone new vehicle purchases until prices normalise. For this reason, the flow of used vehicles to scrapyards has declined, reducing the supply of recycled metals as well. In addition, in a low PGM price environment, auto recyclers have been postponing the release of spent catalysts or metal recovery in anticipation of a price rebound.



# Nornickel's development strategy

Nornickel pursues a moderate growth strategy. The Company is committed to maximising efficiency and ensuring the liquidity of all current and future products.

The Company's development strategy is focused on:

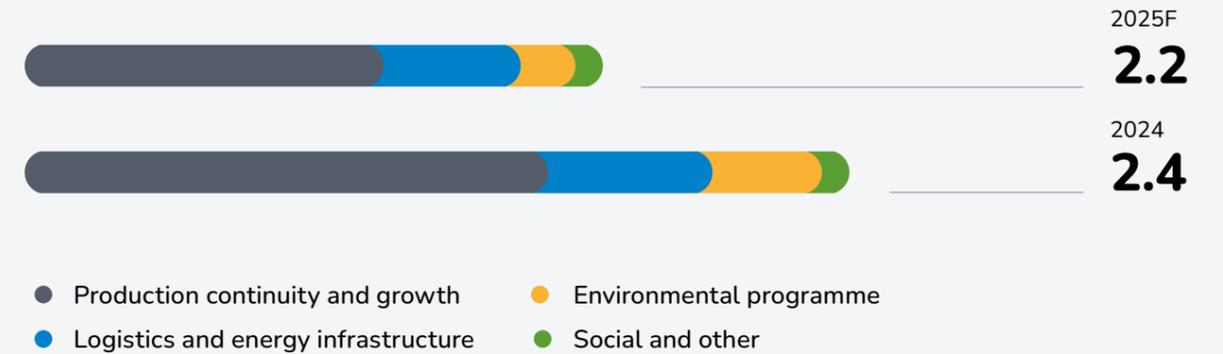
  
 Growth in mining production and concentration volumes

  
 Maintaining market positions

  
 Upgrading processing facilities



Structure of the Company's investment programme for 2024–2025 (USD BN)



The Company upholds its commitment to sustainability principles, implementing:

  
 Environmental and Climate Change Strategy

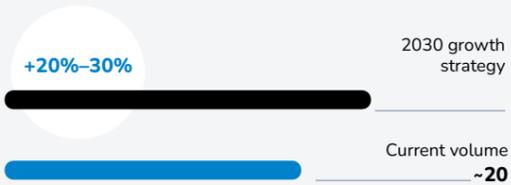
  
 Socially Sustainable Development Strategy



## Growing mining production volumes, upgrading processing facilities, and maintaining market positions

### Norilsk site

#### Mining production growth (MTPA OF ORE)

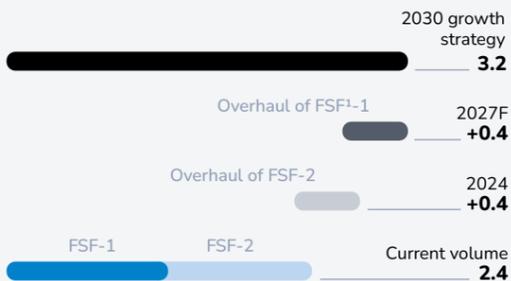


#### Concentration (MTPA OF ORE)



#### Upgrades of metallurgical assets

##### Smelting capacity (MTPA OF CONCENTRATE)



BY **8** MTPA OF ORE  
 Talnakh Concentrator's capacity increase

### Kola site

#### Severn Mine

Maintaining production at

**7** MTPA OF ORE  
 until 2048 through the development of reserves down to a depth of 730 metres

### Infrastructure

- Increased throughput capacity of the Dudinka port and the Company's own terminal in Murmansk
- Renovation of generation capacities
- Comprehensive reduction of energy losses

### Trans-Baikal Division

#### Mining and processing plant (MMP)

One of the mining industry's largest greenfield projects, built in record time

The MMP processes ores from the Bystrinskoye deposit into copper, magnetite ore, and gold concentrates.

Production volumes for 2024

Ore processing **11** MLN T

**Cu** **70** KT  
 in concentrate

2025 forecast:

**Cu** **66–70** KT  
 in concentrate

#### Production volumes for the Group<sup>1</sup>

	2024	2025F
<b>Ni</b>	205.1 KT	204–211 KT
<b>Cu</b>	363 KT	353–373 KT
<b>Pd</b>	2,762 KOZ	2,704–2,756 KOZ
<b>Pt</b>	667 KOZ	662–675 KOZ

#### Maintaining leading positions in metals production:

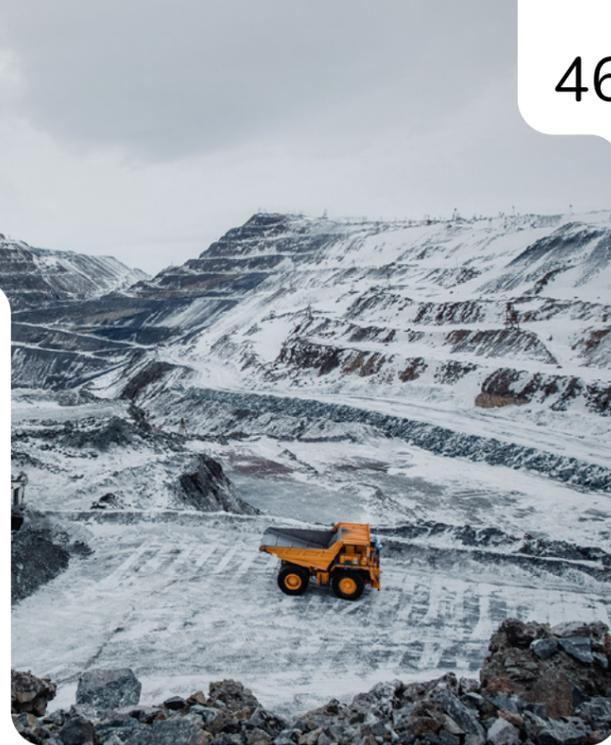
- No. 1** Palladium
- No. 2** Nickel metal
- No. 4** Platinum
- No. 13** Copper

<sup>1</sup> FSF – flash smelting furnace.

<sup>1</sup> Excluding the Trans-Baikal Division.

## South Cluster: growing production volumes

A large existing deposit with a long reserve life (over 20 years) in the bottom quartile of the PGM cost curve.



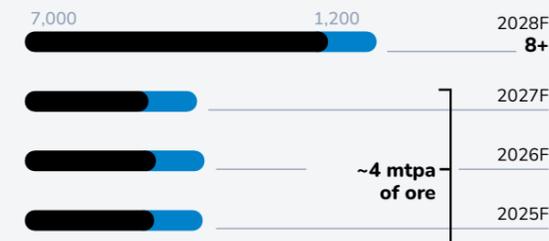
**137** MLN T

Disseminated ore reserves<sup>1</sup>



- In 2024, a **positive opinion was obtained from Glavgosexpertiza** following the re-examination of the design and cost estimate documentation. Subsequently, the development of optimisation measures for mine construction commenced.
- **Mine development** and construction works are ongoing for the underground mine and related infrastructure facilities.
- In 2025–2026, **the Company intends to secure positive opinions from Glavgosexpertiza as well as a certificate of compliance** for the mine and related infrastructure construction project.

### Ramp-up to design capacity in 2025–2028 (MLN T)



- Open-pit mining
- Underground mining

\* The production schedule within the pit perimeter is aligned with the development plan for the Group's processing facilities.

### 2028 production targets

**Ore** \_\_\_\_\_ **8.2** MLN T

**PGMs** \_\_\_\_\_ **750–850** KOZ

**Ni** \_\_\_\_\_ **13+** KT

**Cu** \_\_\_\_\_ **20+** KT

## Upgrade of Talnakh Concentrator: the third start-up facility

The project's goal: major capacity expansion based on proven technology to process growing Talnakh ore volumes and unlock strategic optionality for the South Cluster development project.

### Project status

- In 2024, the design documentation was adjusted, and the execution of supply contracts for flotation and thickening equipment was completed.
- Tendering is currently underway for ore dressing units and ore feeders, covering a range of activities to complete construction and installation, including the installation of metal frames and fences.
- Installation of foundations for the blower and reactor process equipment is currently underway.
- In 2025, the Company plans to secure a positive opinion from the Main Department of State Expertise (Glavgosexpertiza) on the amended design documentation.

### Projected implementation timeline

Commissioning of the third start-up facility is expected in the fourth quarter of 2028, with subsequent ramp-up through 2029.

Capacity additions  
**+8** MPTA

Expected increase in metal recovery  
**+4–7%**

## Upgrade of flash smelting furnaces at Nadezhda Metallurgical Plant (NMP)

- In 2024, NMP completed an overhaul of FSF No. 2, a unique project comparable in scale and effort to constructing a new furnace.
- Despite the logistical challenges and constraints caused the disruption of equipment supplies from foreign vendors, the project was completed in less than 60 days.
- The project resulted in a 25% increase in the furnace's capacity for concentrate processing.
- The Company is currently developing a set of measures to upgrade FSF No. 1 with a waste heat recovery boiler, planned for implementation in 2027.
- The FSF No. 1 upgrade also includes production capacity expansion at NMP.

<sup>1</sup> Proven and probable reserves according to the JORC Code as of 1 January 2025.

## The Trans-Baikal Division's mining and processing plant



Life of mine  
**OVER 20 YEARS**



**50.01%**  
owned by Nor nickel



EBITDA for 2024 totalled  
**USD 1.1 BN**

- In 2024, the first projects under the long-term efficiency and capacity expansion strategy came online: magnetic separation capacity additions and a gold concentrate dehydration unit. The development of main technical solutions was also completed, and the preparation of detailed design documentation commenced for the gold mill project.
- In 2025, projects to upgrade the grinding circuit, flotation section, and thickening section of the concentrator are scheduled for commissioning. Plans are also in place to commence construction of a gold mill.

**One of the largest greenfield projects in Russia's mining industry.**

Ore reserves  
**272 MLN T**

Cu	Fe	Au
~0.52%	~18.7%	~0.65 g/t <sup>1</sup>

Production volumes	2024	2025F
Ore <sup>2</sup>	11.3 MLN T	11.5 MLN T
Cu in concentrate	70.0 KT	66–70 KT
Iron ore concentrate	2.9 MLN T	2.75–2.85 MLN T

## Mining capacity expansion at Severny Mine

### Site overview

Active complex-sulphide concentrate production site comprising several assets:

- Severny underground mine
- Zapolyarny Concentrator
- Concentrate shipment section
- Auxiliary infrastructure facilities

**Location:** Murmansk Region, ~250 km from the Murmansk sea port, access by rail.

**Existing key customers** include leading manufacturers of battery materials in China.

**In 2024, a project** was launched to develop reserves down to a depth of 730 metres, enabling ore production at a rate of 7 mtpa until 2048.



Production volumes for 2024

**7+**  
MLN T OF ORE

**250+**  
KT OF CONCENTRATE

Ni	Cu	Co
25 kt	11 kt	0.8 kt

Mineral resource base	Measured and indicated resources		Inferred resources	
Ore	422 MLN T		55 MLN T	
Ni	2,796 KT	0.66%	408 KT	0.75%
Cu	1,376 KT	0.33%	198 KT	0.36%

<sup>1</sup> Ore reserves as per the 2023 CPR as of 1 January 2025.  
<sup>2</sup> Processed ore volumes.

# Infrastructure expansion and upgrades

## Logistics Infrastructure Development Programme

### Programme rationale

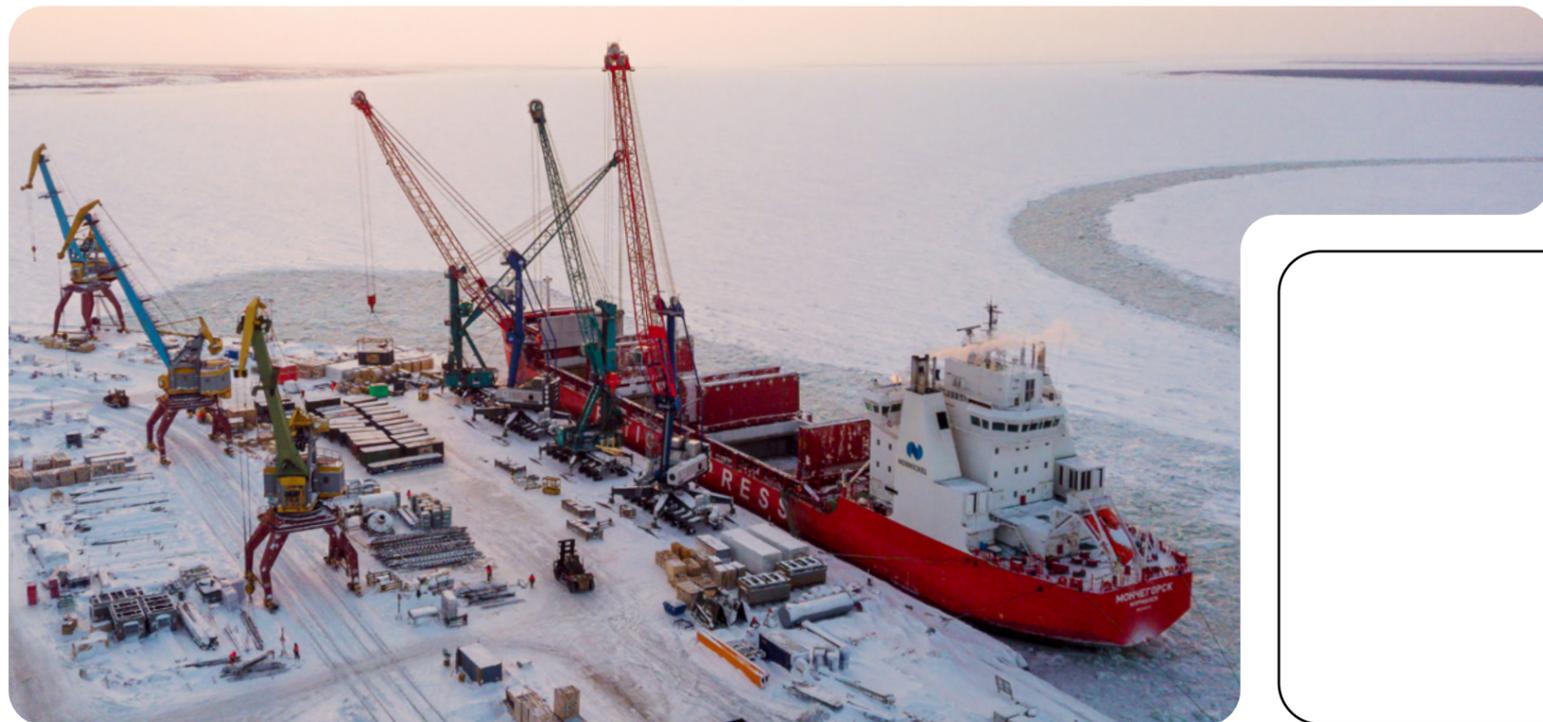
- **Increased volumes** of westward shipments of semi-products once the copper production chain reconfiguration programme is completed.
- **Adjusted pace** of fixed asset replacement in the Norilsk Industrial District, reflecting the optimisation of the investment programme.
- **Expansion of Northern Sea Route** operations and increased freight volumes for major investment projects of other companies using the NSR in the Russian Arctic.

### Major projects



**UP BY 50% Y-O-Y**

Increase in the throughput capacity of the Dudinka port (the Gateway to Taimyr) and the terminal in Murmansk<sup>1</sup>



**Contribution to energy efficiency: reinforced emphasis on higher output of the new units at CHPPs and HPPs and comprehensive energy loss reduction throughout the electricity value chain**

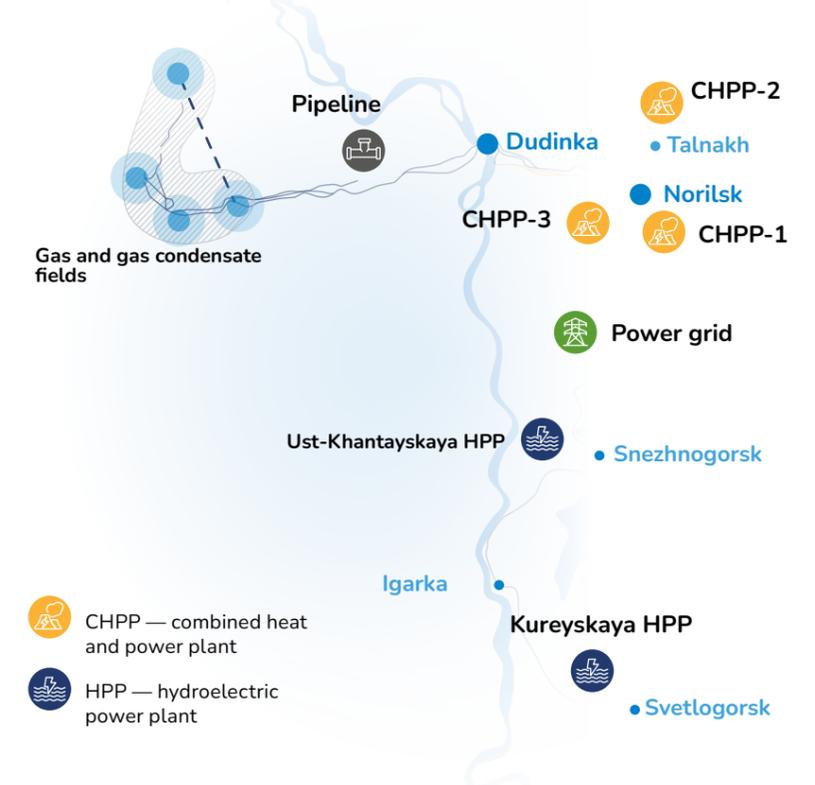
## Energy infrastructure upgrade programme

**Programme goal: renovate generation facilities and energy grid infrastructure to ensure the reliable supply of all types of energy to consumers in the Norilsk Industrial District.**

### Gas and gas condensate exploration, production, and transportation

- In 2024, a retrofitting project was completed for a gas pipeline's underwater crossing of the Bolshaya Kheta River.
- **Drilling** operations continue on five wells at well pad No. 4 of the Pelyatkinskoye gas condensate field, expected to come online in 2025.
- **Pre-commissioning operations are underway** at the booster compressor station of the Severo-Soleninskoye gas condensate field, with commissioning planned for 2025.

### Energy infrastructure



### NGV fuel

In 2024, a CNG filling station was commissioned in Norilsk.

### Combined heat and power plants

- In 2024, construction and installation activities were completed for the revamp of

Unit No. 2 of CHPP-2, with pre-commissioning operations ongoing and commissioning scheduled for 2025.

- **The tank farm revamp programme** continues, with five new tanks constructed since its start:
  - 2 tanks at CHPP-1
  - 2 tanks at CHPP-2
  - 1 tank at CHPP-3

<sup>1</sup> At peak, cargo traffic is expected to increase by 50% compared to the average level by 2030.

## Sulphur Project at Nadezhda Metallurgical Plant

The Sulphur Project 2.0 at Nadezhda Metallurgical Plant includes technological upgrades to recover SO<sub>2</sub> from off-gases of the main smelting units (flash smelting furnaces) by converting them into sulphuric acid and then neutralising it with limestone to produce gypsum – environmentally non-hazardous waste to be placed in a gypsum storage facility.

✓ Throughout 2024, Nornickel gradually commissioned core gas recovery equipment to support the project's ramp-up to design capacity and put the second process line into operation.

✓ All items in the 2024 emission allowance compliance plan have been completed.

✓ Control (supervisory) activities by Rosprirodnadzor confirmed the high efficiency and successful ramp-up of the sulphur complex across sulphuric acid production lines 1 and 2.

✓ In 2025, construction and installation works on process line 3 are scheduled for completion, to be followed by comprehensive testing to ensure stable and efficient sulphur dioxide recovery and create the necessary production reliability margin.

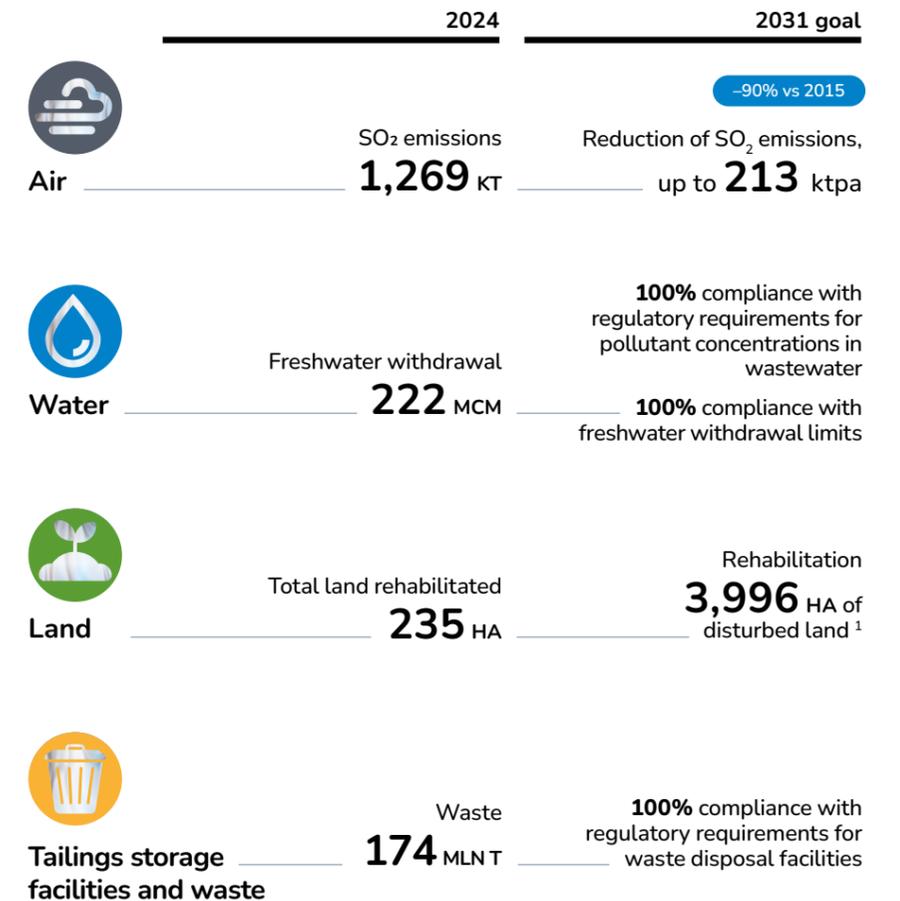
In 2024, the Company recovered  
**~390** KT  
 of sulphur dioxide

Gas recovery efficiency confirmed at  
**>99%**



## Environmental programme

Reducing environmental impact remains one of the Company's strategic priorities.



For more details on Nornickel's Environmental and Climate Change Strategy targets and measures to achieve them, please see the [Environment and Climate](#) section and the Company's [Sustainability Report](#).

<sup>1</sup> From the 2022 base year.

# Social

The 2030 Socially Sustainable Development Strategy covers four focus areas:

1



Health and safety

2



Talent management and corporate culture

3



Developing technologies and products to foster technological and social progress

4



Involvement in the lives of local communities and society at large

The Socially Sustainable Development Strategy supports Nor Nickel's strategic priorities

	Safety and environment	Strategy for sustainable development	Modernisation and technology-driven growth
Priorities	<ul style="list-style-type: none"> <li>No major accidents and employee fatalities across Company assets</li> <li>Minimisation of environmental impacts across key areas, including climate, water, air, land, and biodiversity</li> </ul>	Maximisation of the current capacity potential of mines, concentrators, and metallurgical assets	<ul style="list-style-type: none"> <li>Equipment upgrades and restoration of buildings and structures</li> <li>Energy infrastructure upgrades</li> <li>Technology-driven expansion of production capabilities</li> </ul>
Key challenges	<ul style="list-style-type: none"> <li>Development of new capabilities in environmental impact reduction technologies</li> <li>Transformation of an employee safety culture and enhancement of safety risk management</li> </ul>	Ensuring the availability of qualified personnel to match production configuration of approved projects	<ul style="list-style-type: none"> <li>Deployment of new technologies to reduce human labour requirements</li> <li>Training for new employees</li> </ul>
Socially Sustainable Development Strategy goals supporting the Company's priorities	<ul style="list-style-type: none"> <li><b>1</b> Achieving zero fatalities and reducing workplace injuries and occupational diseases</li> <li><b>4</b> Minimising social risks related to the Company's operations</li> <li><b>4</b> Fostering sustainable social and economic development across the Company's footprint</li> <li><b>4</b> Contributing to the well-being of society nationally and internationally</li> </ul>	<ul style="list-style-type: none"> <li><b>2</b> Attracting young talent and experienced professionals and reducing the turnover rate to 8% by 2026</li> <li><b>4</b> Fostering sustainable social and economic development across the Company's footprint</li> </ul>	<ul style="list-style-type: none"> <li><b>1</b> Mitigating physical risks through process upgrades and automation</li> <li><b>1</b> Aligning workplace conditions with employee needs</li> <li><b>2</b> Driving talent retention through professional growth and development opportunities, with the goal of reducing the turnover rate to 8% by 2026</li> <li><b>3</b> Developing technologies and products to foster technological and social progress</li> <li><b>4</b> Minimising social risks related to the Company's operations</li> </ul>

**x** Focus area of the Socially Sustainable Development Strategy



For more details on Nor Nickel's Socially Sustainable Development Strategy targets and measures to achieve them, please see the Company's [Sustainability Report](#).