STAYING IN SHAPE

Nornickel – No. 1 in metal nickel production in 2023

Chairman's letter

The Company's leadership managed to fully deliver on its production guidance and – more importantly – to sell all metals produced in the reporting period by redirecting sales to friendly countries.

Dear shareholders,

The year 2023 was marked by a slump in prices for our core metals and lingering external political pressure on Russian business, which could not but impact our annual financial results. Our revenue decreased 15% to USD 14.4 billion while EBITDA was down 21% to USD 6.9 billion.

Nevertheless, the Company's leadership managed to fully deliver on its production guidance and – more importantly – to sell all metals produced in the reporting period by redirecting sales to friendly countries. At the same time, effective cost control measures backed by forex tailwind resulted in lower cash operating costs and a solid EBITDA margin of 48%.

Despite challenging conditions in the global financial and commodities markets and non-cooperation by certain equipment suppliers, we continued to execute our investment programme, which amounted to USD 3 billion in 2023. I would like to specifically highlight the launch of the keenly anticipated Sulphur Project at Nadezhda Metallurgical Plant, which became the largest environmental programme in Russia in recent years. When the project reaches its full capacity, it will help meet legal requirements for reducing pollutant emissions in Norilsk by at least 20% in 2024, and by 45% in 2025, from a 2015 baseline.

Our environmental efforts were not limited to the Sulphur Project. For example, we made significant progress in cleaning up legacy pollution in the Norilsk Industrial District, reducing wastewater discharge, and boosting waste utilisation. The Company also teamed up with several research teams from the Siberian Branch of the Russian Academy of Sciences to conduct a biodiversity study across the Company's footprint that was unique in scope and depth.

As far as occupational health and safety is concerned, we continued our mine safety programmes by deploying new digital solutions and improving equipment and personnel tracking systems.

48%
EBITDA margin

USD 3 BN
Total investments

48%
Targeted reduction in pollutant emissions by 2026

Tragically, five fatal accidents were recorded at the Company in 2023, compared to four such accidents in the year prior. All accidents were thoroughly investigated, with the resulting reports submitted to the Board of Directors and action plans developed to eliminate their root causes. The Company continues improving the quality of its incident investigations to prevent new accidents, while also redesigning its occupational safety communications with employees. As Board Chairman, I reiterate that achieving zero work-related fatalities is a top strategic priority for Nornickel.

Last year, the Company also focussed on joint business diversification projects to support technology innovation. Polar Lithium, a joint venture between Nornickel and ROSATOM, has been awarded a licence to develop Kolmozerskoye, Russia's largest lithium deposit. The development of this deposit will enable us to become Russia's first-ever producer of lithium-bearing raw materials and eventually high-tech products such as lithium-ion batteries. Nornickel also acquired an interest in Russian Stainless Company, which is implementing a project for the production of flat-rolled stainless steel products in the Volgograd Region. Through this project, Nornickel will substantially boost its nickel sales in the domestic market and integrate into the manufacturing of high-tech products from steels and alloys.

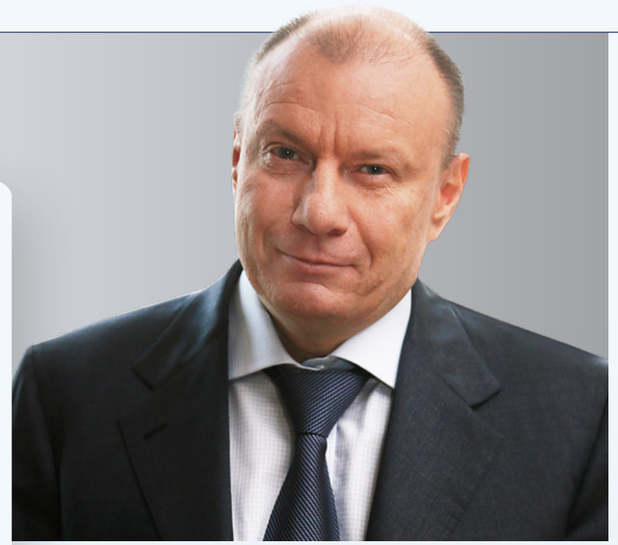
On top of this, Nornickel was lauded as a top performer in sustainability and responsible business practices and recognised as a first-degree winner of the Responsible Business Leaders national award.

Finally, to accommodate our more than 400,000 shareholders, we have decided to do a share split to boost our stock's liquidity and make our shares more accessible to a wider range of retail investors, as well as to pay a dividend for the first nine months of 2023. We believe that this move will contribute to further expansion of Nornickel's shareholder base and the growth of the Russian stock market more broadly.

Andrey Bougrov

Chairman of the Board
of Directors MMC Norilsk Nickel

President's letter



2023 results confirmed Nornickel's ability to demonstrate operational resilience even in a challenging economic and geopolitical environment.

Dear shareholders,

Looking back on 2023, I would immediately highlight the fact that the year confirmed Nornickel's ability to demonstrate operational resilience even in a challenging economic and geopolitical environment. As this Report shows, we have succeeded in highlighting that the Company we all build together is ready to face any critical challenge through strict adherence to our production schedule, a responsible approach to investment, and coordinated efforts of the entire team.

Last year, Nornickel and the broader Russian economy grappled with severe sanctions, which, coupled with inflation and volatility across global commodity and financial markets, adversely affected the Company's key financials. Lower market prices for almost all of our metals drove down our revenue and EBITDA. However, we were able to reverse the negative trends of 2022, caused by the need to rethink our logistics and distribution chains. The Company sold all metal volumes produced in 2023 as well as some of its inventories that built up over 2022.

We have maximised our focus on metrics within our control and achieved notable successes in these areas, substantially cutting our operating costs and working capital. CAPEX totalled close to USD 3 billion in 2023, remaining at a record-high level in rouble terms.

We are currently adjusting our long-term investment plans due to a changing geopolitical situation, self-sanctioning by some of our partners, and a more challenging macroeconomic environment. We are redesigning some projects, exploring alternative solutions, and looking into import substitution opportunities.

In October 2023, Nornickel launched the Sulphur Project at Nadezhda Metallurgical Plant in Norilsk. This is a flagship project of national importance, believed to be the largest environmental programme in Russia.

Construction has taken more than three years. Although certain international vendors refused to provide critical equipment to Russia, we successfully sourced alternative suppliers and completed the project on schedule. As a result, Norilsk now hosts in effect a brand new facility with approximately 500 new jobs. The key thing, however, is that air quality in Norilsk has improved dramatically.

Last year, we approved our Sustainable Development Strategy until 2030, which encompasses four pillars: occupational health and safety, talent management, technological development, and social advancement and enhancements to the quality of life. We fully recognise that major businesses are responsible for developing local communities and for promoting the well-being of wider society, and we reiterate our commitments to stakeholders.

In 2023, Nornickel launched an innovative corporate programme, Digital Investor, under which as many as over 60 thousand employees have already been granted digital financial assets with a value equivalent to the price of Nornickel shares and received their first dividends.

In conclusion, I would like to express confidence that together we will achieve our goals and will unlock the full potential of our business to the benefit of our employees, investors, and all stakeholders who care about our success.

Vladimir Potanin
President
Chairman of the Management Board MMC Norilsk Nickel

Commodity markets

Nornickel metals' applications

Application area	Description
PGMS	
Automotive industry	Palladium, platinum, and rhodium are used as the active material in automotive exhaust gas catalysts to minimise the vehicles' environmental impact
Hydrogen solutions	Platinum, palladium, iridium, and ruthenium are widely used in rapidly developing hydrogen technologies. Platinum group metals find application as catalysts in low-carbon hydrogen production as well as for hydrogen purification, transportation, and use as an energy source in fuel cells
Chemical and petrochemical industries	Palladium, platinum, and rhodium are used as catalysts in chemical and petrochemical processes to boost process performance
Jewellery	Palladium and platinum are used in all kinds of jewellery, which is renowned for its beauty but also for durability
Electronics	Palladium is used as material for capacitors, motherboards, and other components, while platinum is primarily used in hard drives, and rhodium in coatings for connectors and contacts
Healthcare	PGMs are extensively used as catalysts in drug synthesis. Palladium has also found wide application in dentistry, while platinum is used in medical devices such as pacemakers and as an active ingredient in anti-cancer medicines
Glass fibre and optical glass	Platinum and rhodium are used to manufacture bushings for making glass fibre and optical glass
NICKEL	
Mechanical engineering, chemical and petrochemical industries, and construction	Nickel is used in stainless steel production. Adding nickel as an alloying element to stabilise the austenite structure enhances steel's corrosion resistance, high-temperature properties, weldability, formability, and resistance to aggressive environments
EV batteries	Nickel is a key element used in the production of precursor cathode active materials for EV batteries. The dominating technologies include nickel-intensive NCM and NCA batteries, owing to their higher volumetric and gravimetric energy density, which increases drive range. Nickel-based batteries are also more recyclable and reusable than other types of batteries
Aerospace industry	Nickel alloys are highly resistant to heat and aggressive environments and are used in the manufacturing of aircraft engines
Renewable energy	Nickel alloys are used in wind, solar, and geothermal power generation
COPPER	
Automotive industry	The automotive industry uses copper in batteries, electric motors, inverters, wiring, and charging infrastructure. Transport electrification is expected to become a key driver behind copper demand in this decade
Construction and air conditioning and cooling systems	The construction sector uses copper in pipes and tubing, heating and cooling systems as well as in wall cladding. Electrical and communication cables are also mostly made of copper
Renewable energy	Copper is intensively used in the construction of wind, solar, and other types of renewable power plants
Electronics and home appliances	Copper is used in electronics and home appliances due to its excellent electrical and thermal conductivity
Network infrastructure	Copper is used in power generation, transmission, and distribution as well as in all types of wiring. A strong push for transport electrification and transition to renewable energy will require significant expansion of distribution networks

Nickel market

Key market trends

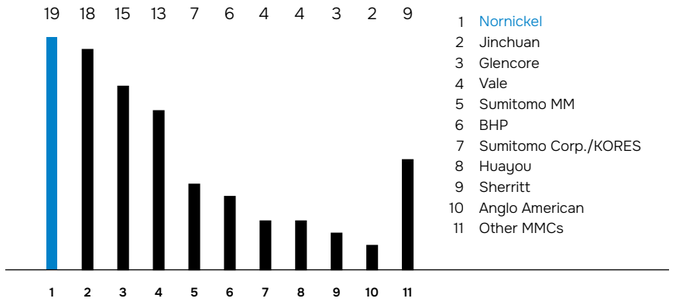
Nickel surplus persisted in 2023, exceeding 200 kt (compared to 113 kt of surplus in 2022), mostly in the low-grade nickel market. However, the high-grade exchange nickel market remained balanced as the inflow of metal to exchange warehouses was insignificant while alloys and specialty steels continued to generate steady demand.

In 2023, nickel was the worst performer among base metals on the London Metal Exchange (LME) due both to a significant surplus in the Class 2 market owing to oversupply of NPI in Indonesia following the commissioning of new capacities to produce nickel cathodes in China and Indonesia and the price correction following a massive short squeeze and growing speculative trading in the past year.

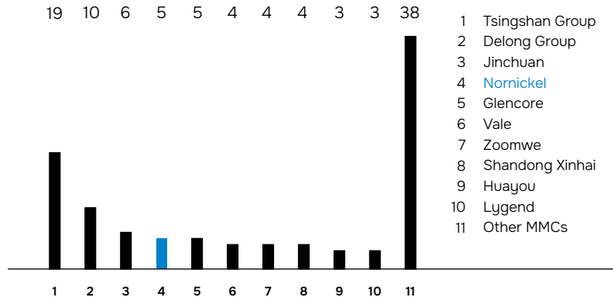
Early in the year, the price exceeded USD 31,000/t but dropped to USD 22,000/t in mid-March triggered by news that some Chinese nickel producers were considering launching production of nickel cathodes in China and Indonesia as early as in 2023. Another headwind was weak domestic demand in China amid prospects of further monetary policy tightening in the US and Europe.

In April, nickel prices rebounded to above USD 25,000/t, spurred by the short covering by speculative players, lower exchange inventories, and a weaker US dollar. The growth, however, was curbed by weak market fundamentals, and as a result the price slipped to USD 20,000–21,000/t in late May.

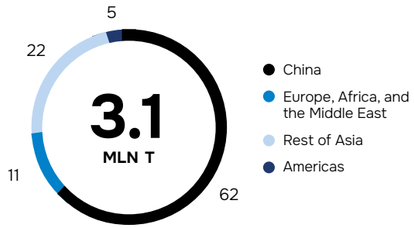
Nornickel – No. 1 in Class I nickel production, %[1]



Nornickel – No. 4 in primary nickel production, %[1]



Primary nickel consumption by region, %



Source: Company data

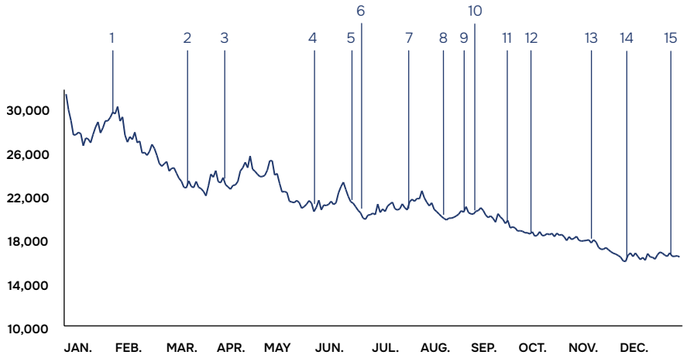
[1] Sources: producer reports, Company analysis as of early March 2024

In June–July, the LME nickel fluctuated within the range of USD 20,000–23,000/t as the expected recovery of the Chinese economy slowed down. In August, the price was supported by the news of a clampdown on illegal mining in Indonesia, followed by delays in the distribution of Indonesia's new quotas for nickel ore mining.

In the fourth quarter, nickel price fell below USD 20,000/t due to a surge in supply, weak demand from the European and US stainless steel sectors, and a record-high number of LME short positions of investment funds amid inflationary pressure and high interest rates around the world. Despite news that Indonesia wouldn't approve any new nickel mining quotas for 2023 and the country's high-grade nickel resources could face depletion in six years, the LME nickel plunged to USD 16,000/t late in the year.

As a result, the average nickel price in 2023 amounted to USD 21,474/t, or 16% below the average 2022 price (USD 25,605/t).

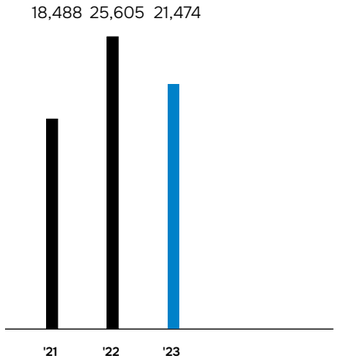
LME nickel price in 2023, USD/T



1. EV producers start to cut prices due to slowdown of demand growth
2. US banking crisis
3. LME announces action plan to strengthen its markets
4. Indonesia puts nickel export levy on hold
5. Huayou Cobalt launches Huafei HPAL project in Indonesia
6. China extends EV tax benefit scheme to 2027
7. LME approves Huayou's nickel cathodes as new brand
8. Indonesia arrests former top official accused of illegal mining
9. Tsingshan starts production of nickel cathodes in Indonesia
10. Distribution of Indonesia's mining quotas is delayed
11. The announcement, that Indonesia will not approve any new nickel ore mining quotas for 2023
12. Glencore to stop funding its Koniambo FeNi project
13. LME approves listing of GEM's nickel cathodes
14. Talks about a new Indonesian nickel price index
15. Germany cancels tax benefits for EVs

Source: London Metal Exchange, Company analysis

Average annual nickel prices, USD/T



Source: London Metal Exchange (cash settlement)

Market balance

In 2023, primary nickel use grew 4% y-o-y to 3.1 mln t amid steady growth in the stainless steel sector (up 4% y-o-y). Demand in the battery sector was down (–1% y-o-y) due to the continued destocking cycle in the EV supply chain, a greater share of non-nickel LFP batteries, and a partial shift from BEV to PHEV sales in China. In 2023, nickel use in other industries (alloys, special steels, plating, etc.) increased by 6% y-o-y amid a stable environment in the aerospace, oil and gas, and military industries.

On the other hand, global primary nickel production grew 9% y-o-y to 3.4 mln t in 2023, driven by the continued growth in the Indonesian NPI (up 16% y-o-y) and nickel compounds output for the battery sector (up 31% y-o-y). The increase was due to the launch of new NPI-to-matte conversion and high-pressure acid leaching (HPAL) projects. Metal nickel production grew 7% y-o-y due to new nickel cathode production capacities launched in China and Indonesia.

As a result, in 2023, the nickel market moved into a surplus of more than 200 kt, mostly in low-grade nickel as last year, while the high-grade nickel market remained relatively balanced. However, given the substantial increase in current working stocks over the last years, which, according to our calculations, rose by as much as 100–200 kt Ni, the actual market surplus, i.e. excessive material available for immediate delivery, could be much smaller.

Consumption

Stainless steel remained the key sector of primary nickel use in 2023 (about 65% of total demand).

Stainless steel production uses almost all types of nickel feed (except for some 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 2023, global output of stainless steel grew 3% y-o-y to 58 mln t amid the launch of new capacities in China, where production rose 10% y-o-y. In other Asian countries, stainless steel output declined 5% y-o-y, primarily due to lower production in Indonesia, which faced operational issues at a steelmaker caused by a conflict between shareholders, as well as due to weak operational performance in Japan and Taiwan. Meanwhile, stainless steel output dropped 7% y-o-y in Europe and the US due to destocking, higher imports from Asia, and weak consumer demand. As a result, primary nickel consumption in the stainless steel sector increased by 4% in 2023 and exceeded 2Mt.

The **battery industry** uses nickel as a key element in the production of cathode precursors for batteries. Despite record-high EV sales, nickel demand in the battery sector slipped 1% to 0.5 mln t in 2023 due to destocking across the battery value chain in China, higher non-nickel LFP share, and a partial shift from BEV to PHEV sales

3.1 MLN T
Primary nickel consumption in 2023

3.4 MLN T
Primary nickel production in 2023

Nickel production and consumption balance, KT
(excluding changes in current reserves)

Source: Company's assessment as of March 2024

in China, which have lower battery capacity and, in turn, lesser nickel content.

In 2023, global EV sales[1] grew 29% y-o-y. Following several years of rapid growth, the EV market seems to be entering a maturity phase and grappling with the associated challenges of further expansion.

Sales in China decelerated to 23% y-o-y following the country's partial withdrawal of the EV subsidies at the end of 2022. However, EV sales have been consistently rising in absolute terms. For instance, 5.7 million battery electric vehicles (BEVs) were sold in China in 2023, up 19% y-o-y from 4.8 million in 2022, while plug-in hybrid electric vehicle (PHEV) sales surged almost twofold to 2.7 million (up 88% y-o-y). Additionally, China has surpassed Japan as the world's largest automotive exporter, a core part of which has been EVs.

Furthermore, support for the EV sector in China continues to flow. Recently, a national pilot involving eight separate ministries was launched to replace internal combustion engine (ICE) vehicles with EVs in public domain vehicle fleets. This incorporates not only public buses but also taxis and government vehicles. When coupled with ongoing support for a rural EV buildout, this should ensure that the domestic China market continues to grow faster than the rest of the world.

Sales in Europe rose by 28% y-o-y, while constrained by the removal of subsidies in several countries. Additionally, there has been an influx of cheap Chinese EVs into the European market. In 2023, the share of Chinese BEV deliveries increased twofold to about 10% of total European BEV sales, with SAIC-owned MG being the fourth best-selling brand after Tesla, Volkswagen, and BMW. In September, the European Commission launched an anti-subsidy investigation to impose additional tariffs on Chinese EVs to protect local producers, potentially slowing down EV penetration rates in Europe, especially in the low-cost segment.

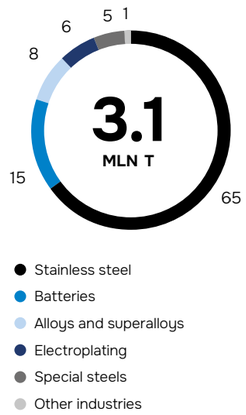
EV sales in the US increased by 50% in 2023, which could be attributed to the adoption of the US Inflation Reduction Act (IRA).

The growing popularity of electric and hybrid cars, along with the evolution of cathode technology towards nickel-intensive types, add 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. In its base case scenario, the Company estimates that the nickel use in batteries will reach approximately 1.5 mln t of nickel by 2030, or 30% of total primary nickel demand (compared to 15% in 2023). Meanwhile, this figure may require further revisions given the continuous introduction of more ambitious carbon neutrality goals, subsidies-driven transport electrification, and cost optimisation of battery cell production.

In 2023, nickel use in **other industries** (alloys, special steels, plating, etc.) increased by 6%, or 0.6 mln t, amid the gradual post-COVID recovery of industrial demand and robust economic performance in the aerospace, oil and gas, and military industries.

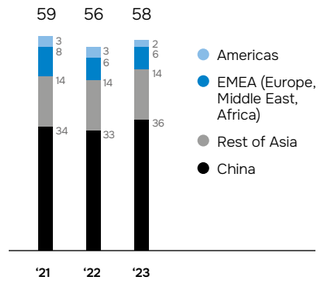
[1] Under this methodology, HEV and PHEV are recalculated according to their relative battery capacity ratio: HEV 2 kWh vs PHEV 12 kWh vs BEV 55 kWh.

Primary nickel consumption by industry, %



Source: Company data

Stainless steel production, MLN T



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

Supply

Primary nickel production can be divided into the high-grade and low-grade nickel segments.

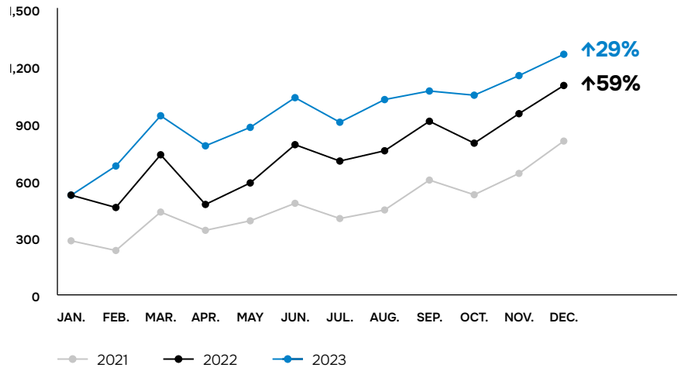
High-grade nickel is produced in the form of nickel cathodes, briquettes, pellets and powder, rounds, and other small special forms as well as chemical compounds, both from sulphide and from more common and available laterite raw materials. 2023's leading producers of high-grade nickel were Jinchuan, Nornickel, Glencore, Vale, Zoomwe, Huayou, 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 2023, 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: Anglo American, Eramet, South32, POSCO, 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 launches of HPAL capacities and the launch of nickel cathode production from low-grade Indonesian s of HPAL capacities and the launch of nickel cathode production from low-grade Indonesian feedsources in 2023.

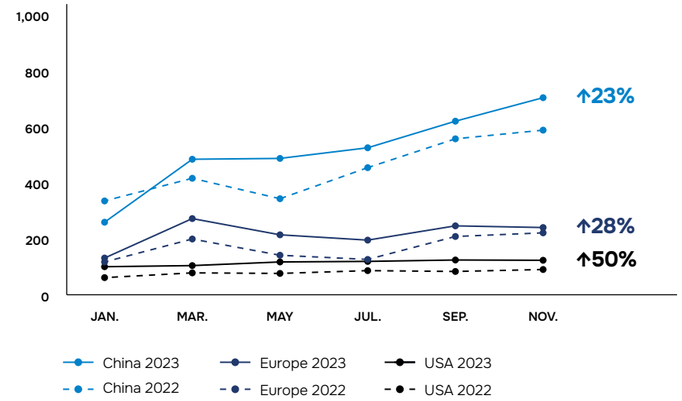
In 2023, nickel producers around the world were affected both by high interest rates, inflationary pressure,

Global sales of electric vehicles, THOUSAND UNITS

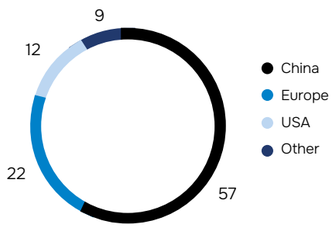


Source: Company analysis

Sales of electric vehicles by region in 2023, THOUSAND UNITS.



Sales of electric vehicles by region in 2023, %



logistical issues, and operational disruptions, and by negative price trends amid oversupply and continued surplus on the market. Nonetheless, primary nickel production grew by 0.3 mln t, or 9% y-o-y, to 3.4 mln t in 2023, driven by the growth in the Indonesian NPI production capacities and the continued underlying growth of nickel compounds for the EV battery sector, mainly fuelled by the launches of new HPAL capacities and NPI-to-matte conversion lines. Another contributor was the rise in metal nickel (Class 1) supply from new refining capacities in China and Indonesia.

Production of high-grade nickel grew 15% to 1.4 mln t in 2023.

Production of metal nickel rose 7% y-o-y to 0.9 mln t. In 2023, metal 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 output grew in Norway (due to the local enterprise's ramp-up to designed capacity after last year's strikes) and Japan (as a result of an increase in nickel converter matte exports from Indonesia) but declined in Canada and Australia on the back of operational issues and maintenance shutdowns.

Nornickel decreased its nickel output somewhat in 2023 owing to the decrease in mined ore volumes due to testing of the mining machinery from new suppliers and the gradual replacement of the existing equipment fleet. Nornickel mines recovered to the scheduled mining volumes in the fourth quarter. In 2023, the Company's nickel output came in line with the annual production guidance.

During the year, **production of nickel compounds**, including nickel sulphate from primary sources (excluding sulphate produced by high-grade nickel dissolution), increased by 31% y-o-y to 0.5 mln t.

Nickel sulphate can be produced from a variety of raw materials by different processes: directly from nickel intermediates such as mixed hydroxide precipitate (MHP), mixed sulphide precipitate (MSP), nickel matte, and crude nickel sulphate (product of copper processing), by dissolving Class 1 nickel (such as nickel briquettes or powder), or from recycled materials.

Despite the fact that nickel sulphate was traded at discounts to LME prices almost throughout the year, its output grew in 2023. The increase was fuelled by scheduled launches of new and ramp-ups of existing intermediates production capacities in Indonesia both at HPAL projects and at NPI-to-matte conversion lines. Chinese producers were the largest nickel sulphate producers in 2023, including Zoomwe, GEM, Huayou, and Jinchuan.

At the same time, nickel sulphate production by high-grade nickel dissolution, considered to be one of the most expensive production method, decreased several times over y-o-y amid the abundance of cheaper intermediates on the market.

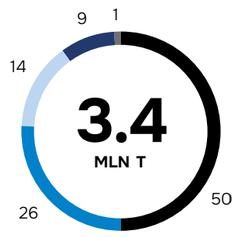
Low-grade nickel output grew by 6% y-o-y to 2.0 mln t.

Indonesia continued ramping up its **nickel pig iron capacities,** which was the main driver behind the growing supply of low-grade nickel in 2023. The growing stainless steel output in China provided significant support to NPI production in Indonesia, but its growth rates slowed down somewhat year-on-year due to some furnaces switching to converter matte production and temporary suspension of new quotas issue for nickel ore mining later in the year, resulting in higher ore cost in the country.

3.4 MLN T

Primary nickel output in 2023

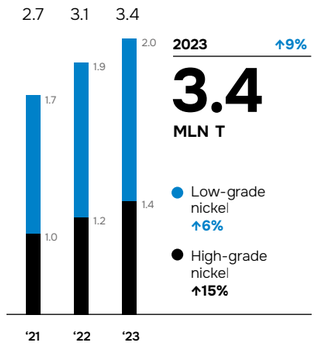
Primary nickel production by product, %



- Nickel pig iron
- Metal nickel
- Nickel compounds
- Ferronickel
- Nickel oxide and utility nickel

Source: Company data

Primary nickel production, MLN T



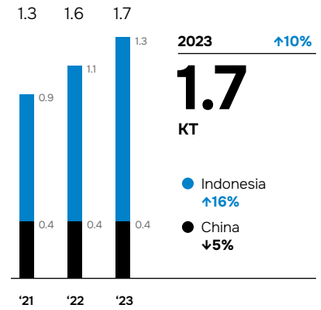
Source: Company data

Overall, we estimate the total 2023 NPI production in Indonesia at 1.3 mln t (up 16% y-o-y).

In 2023, **China's NPI output** continued to decline, falling 5% y-o-y to 0.4 mln t amid stronger imports of Indonesian NPI. Nevertheless, despite the growing competition from Indonesian NPI, the Chinese NPI output was supported by robust stainless steel production and showed a much more moderate decrease than expected.

In 2023, **ferronickel output** continued to decline, slipping to 0.3 mln t of nickel (down 13% y-o-y), a record low for more than a decade. The primary factors behind the decrease are: the continuing negative price dynamics (FeNi is traded at a discount to the LME, at a level close to the NPI prices); high production costs; fuel and electricity issues; some major producers' capacity utilisation rates being low. For instance, there were production shutdowns across several sites, including facilities in Guatemala, Serbia, North Macedonia, Greece, and Ukraine. Technical, operational, and financial disruptions were also observed at projects in the Dominican Republic, Myanmar, Japan, and New Caledonia.

NPI production, KT[1]



Source: Company data

[1] Note: Figures may not sum up due to rounding.

Copper market

Key market trends

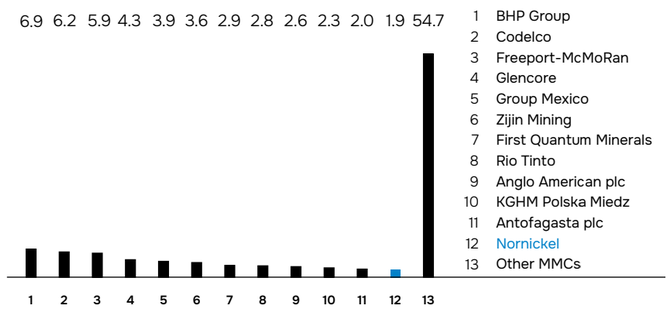
In 2023, factors that affected the copper market included: weaker-than-expected consumption growth in China amid the construction crisis; weak macroeconomic performance across global major economies; tougher monetary policies; low exchange and bonded stocks in China; strikes and social unrest in Latin America; new renewable installed capacity additions; and a stronger push for transport electrification.

During the year, copper prices showed mixed dynamics, trading between USD 7,900–9,400/t. Peak values were recorded in January amid the lifting of COVID-19 restrictions in China and low exchange stocks. Then, driven by higher interest rates in major global economies, fears of investors related to the US public debt ceiling, and weaker-than-expected demand in China, the price retraced down to USD 7,900/t towards the end of the first half of the year. Once the US public debt had been handled, the copper price rebounded to USD 8,700/t in early August. However, macroeconomic challenges, especially in China, continued to have a negative impact on the market, and the price dropped below USD 8,000/t in early October. Late in the year, protests in Panama resulting in the shutdown of the Cobre Panamá mine supported the copper price, which rose to USD 8,600/t.

The total exchange stocks on the LME, SHFE, and CME grew 13% to 215 kt but remain at their historically-low level. Bonded stocks in China plummeted 86% from the start of the year to 8 kt.

In 2023, the LME copper price averaged at USD 8,478/t vs USD 8,797/t in 2022 (down 4%).

Nornickel – No. 12 in copper mine production, %



Sources: producer reports, Company analysis as of late March 2024

Refined copper consumption by region, %

Average annual copper prices, USD/T

Source: London Metal Exchange (cash settlement)

Market balance

In 2023, copper mine output increased by 2% to 22.3 Mt, and refined copper production by 4% to 25.6 Mt. Global refined copper consumption totalled 25.4 Mt, up 2%. Overall, the copper market was balanced in 2023, with a statistical surplus of 130kt, or less than 1% of global consumption.

Consumption

In 2023, global refined copper consumption totalled 25.4 Mt, up 2% y-o-y.

Despite weaker-than-expected demand recovery due to the construction crisis, China ramped up its domestic consumption to 14.5 Mt, or up 6% y-o-y. Imports of refined copper to China fell 4% y-o-y to 3.5 Mt, while imports of scrap and concentrates grew 12% and 9% to 2 Mt and 27.6 Mt, respectively.

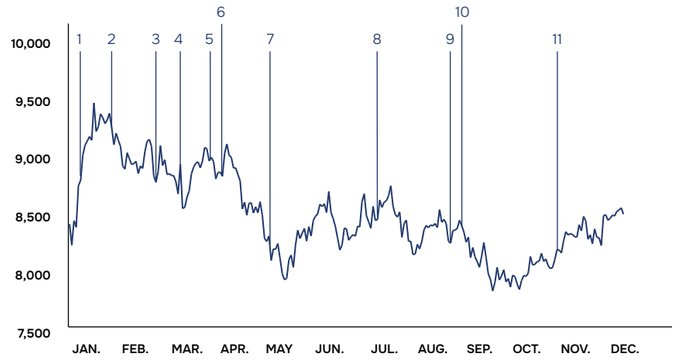
Demand in Europe and North America dropped to 3.1 Mt (down 5% y-o-y) and 2.1 Mt (down 4% y-o-y), respectively, while Asia (excluding China) showed a 1% growth to 5.2 Mt. In Russia, apparent primary copper consumption is estimated at 450kt.

Supply

Global copper production increased 2% to 22.3 Mt driven by the launch of new and expansion of existing projects.

Chile, the world's leading copper producer, slightly cut its copper output in 2023, by 1% to 5.3 Mt, due to technical and operational disruptions faced by Codelco, the country's top producer of the metal. Meanwhile, Peru ramped up its output by 9% y-o-y to 2.7 Mt.

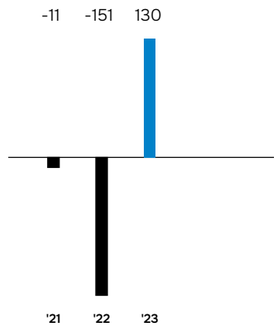
LME copper price in 2023, USD/T



1. China lifts COVID-19 restrictions
2. The Las Bambas mine decides to suspend operations
3. US increases import tariffs for Russian metals
4. Start of the US banking crisis
5. Teck Resources rejects Glencore's 22.5 billion asset acquisition offer
6. BHP buys out OZ Minerals for USD 6.6 billion
7. Chile's senate approves progressive mining royalty bill
8. US sanctions UMMC
9. Udokan Copper starts Cu concentrate production
10. LME stocks are at 2-year highs
11. Cobre Panamá halts operations due to protests of local residents

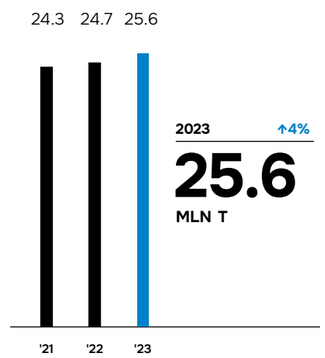
Source: London Metal Exchange, Company analysis

Copper market balance, KT



Source: Company's data as of March 2024

Production of refined copper, MLN T



Source: Company data

Africa managed to increase its output by 9% to 3.6 Mt, with DRC being the top producer through its Ivanhoe's Kamoa-Kakula project.

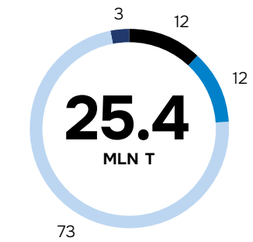
China ramped up its production by 2% to 1.9 Mt, while copper mine production in Indonesia declined 5% to 0.9 Mt.

Production in North America decreased, except for Canada where the output grew 4% to 0.4 Mt. In the US, the decline was 8% to 1.2 Mt, and in Mexico 2% to 0.7 Mt.

Refined copper production grew 4% y-o-y to 25.6 Mt amid new capacity launches in China. In South and Central America, production dropped 4% to 2.5 Mt due to the macroeconomic pressure throughout the year. Africa saw a 16% increase in production to 2.2 Mt, while Asia (including China) ramped up its output by 5% to 15.6 Mt. China's refined copper output increased by 9% to 11.5 Mt, while in Japan it decreased by 1% to 1.5 Mt. Copper output in Europe fell 2% to 3.5 Mt, in North America 4% to 1.5 Mt.

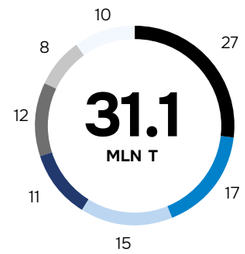
Refined copper consumption by industry

First use, %



Source: Company data

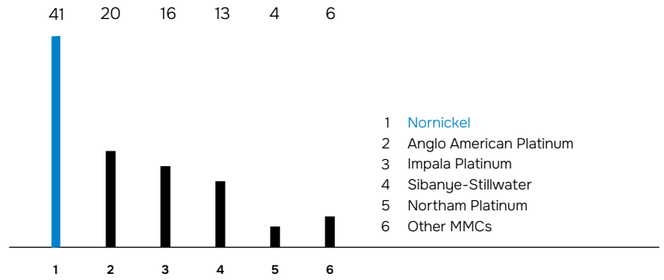
End use by industry, %



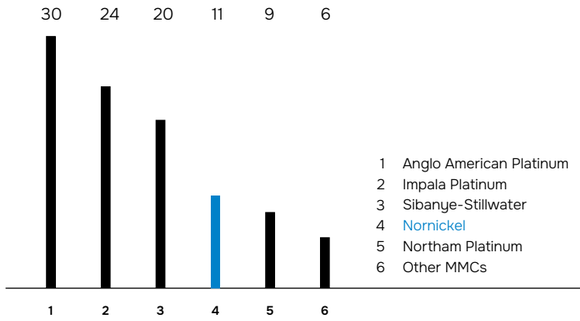
Source: Company data

PGM market

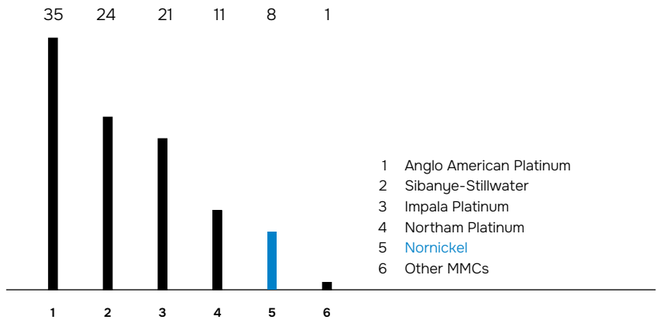
Nornickel – No. 1 in palladium production, %[1]



Nornickel – No. 4 in platinum production, %[1]



Nornickel – No. 5 in rhodium production, %[1]



Sources: producer reports, Company analysis as of early March 2024

[1] Refined metal output including production from third-party feedstock and production from own feedstock by third parties under tolling agreements.

Key market trends

Palladium

Due to low ICE-powered vehicle sales in the first two months of 2023, the palladium price was declining, getting closer to the important USD 1,300/oz support level up until mid-March, when it entered into a horizontal trend, fluctuating between USD 1,300/oz and USD 1,600/oz levels. The trend change was triggered by the US banking crisis, which has supported prices for precious metals as the market lowered its expectations regarding the terminal rate level.

The price continued its downward movement in May to find the next support level at USD 1,225/oz by the end of June. Later, it started trading sideways, fluctuating between USD 1,225/oz and USD 1,300/oz as inflation expectations eased. The sideways trend continued until the beginning of October, when it made a stepdown to a lower price corridor, reaching its bottom at USD 1,125/oz. This occurred amid the Fed representatives' statements regarding the higher-for-longer interest rates environment.

The price plateaued at USD 1,125/oz up until 7 November, when it fell by 4% to USD 1,080/oz. Fed's hawkish statements yet again pressured all the precious metals. This led the palladium price to fall below the psychological level of USD 1,100/oz, which triggered a 3-year-record daily open interest increase on the NYMEX, dipping palladium down to USD 965/oz. Nevertheless, right after that, palladium bounced back and stabilised above the USD 1,050/oz level.

Late in the year, the palladium price showed increased volatility: the excessive volume of short positions resulted in a short squeeze in December, with prices soaring to USD 1,225/oz and then dropping again to USD 1,050/oz.

Platinum

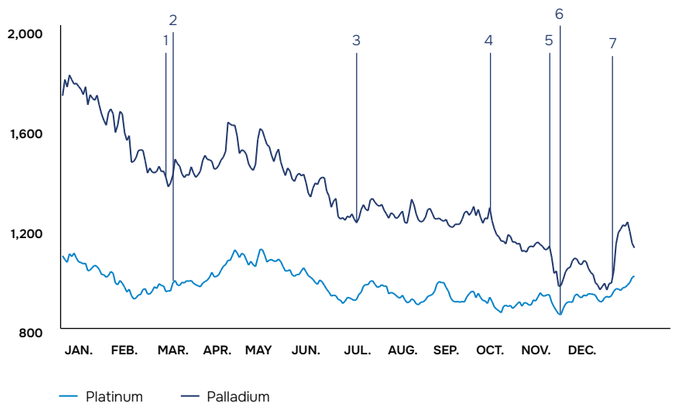
In early January, the platinum price rose slightly above USD 1,100/oz but began to decline by mid-January amid weak car sales. As the automotive market started to recover, the significance of macroeconomic factors in platinum pricing started to strengthen, which led to the platinum price following the upward trend of gold since the end of February.

The price rally continued as the next noticeable resistance level of USD 1,050/oz was broken on 13 April, when South African Eskom announced the return of Stage 6 load-shedding, which drove the price up above USD 1,100/oz level. However, in mid-May, the platinum price started to fall sharply, reaching its bottom at USD 900/oz by late June. This drop was caused, among other factors, by resilience of South African producers to electricity supply disruptions, weak macroeconomic data from China, and hawkish statements by the ECB, which put noticeable pressure on prices for precious metals.

Until the end of October, the price fluctuated between USD 900/oz and USD 1,000/oz, followed by an overall adjustment of prices for precious metals, which led the platinum price to a support level of USD 875/oz.

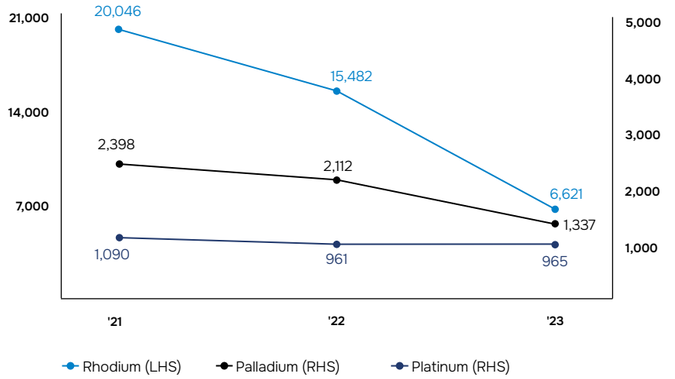
In December, the platinum price soared to above USD 1,000/oz amid statements by South American PGM producers about cutting their output given the depressed PGM basket prices.

Palladium and platinum prices in 2023, LPPM



1. The US and Europe's banking crisis reversed the pricing trend in the PGM market
2. Worsening of the power crunch in South Africa
3. Stabilisation of inflation expectations
4. Fed's hawkish statements
5. Fed representatives' statements regarding the higher-for-longer interest rates environment, and a surge in short speculative positions for palladium
6. Top foreign PGM producers announce production plan cuts amid cost optimisation efforts
7. Short squeeze in the palladium market

Average annual PGM prices, USD/OZ



Source: Company analysis

Market balance

In 2023, the palladium market remained in a significant deficit estimated at 30 tonnes, net of investment demand and consumer stock movement. Sales of stocks by automakers and autocatalyst producers provided additional liquidity to balance the market. Amid stable demand, the deficit increase was mainly driven by lower production. In 2023, palladium supply declined due to lower recycling and output in Russia amid the transition to new mining equipment and scheduled maintenance at Nadezhda Metallurgical Plant and Talnakh Concentrator of the Norilsk Division.

The platinum market moved into a deficit of 12 tonnes in 2023. During the year, global platinum consumption grew amid residual palladium-with-platinum substitution in autocatalytic converters and the launch of new capacities in China's glass industry. Meanwhile, global platinum production stagnated, as lower recycling was offset by the recovery of primary production in South Africa after the lack of smelting capacities and widespread power outages in 2022.

A moderate deficit of 3 tonnes remained in the rhodium market in 2023, which, as in the case of palladium, was balanced by stocks sold by market players. Rhodium production remained at the 2022 level: the recycling fall was offset by the recovery of primary production in South Africa while moderate consumption growth was driven by stronger demand from the chemical and automotive industries.

Consumption

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

Due to their catalytic properties, palladium and rhodium are the key choice for exhaust treatment systems in petrol vehicles, while platinum is used mostly in diesel vehicles. There has been a partial substitution of platinum for palladium in petrol vehicle catalysts in recent years due to a significant price spread between the metals. The peak level of substitution was reached in 2023, as the narrowed price spread between palladium and platinum leaves no incentives for a short-term substitution.

In 2023, Western regulators decided to adopt new environmental standards in the US and Europe, which will support PGM consumption in the automotive industry in the longer run. Moreover, in late 2023, global demand for EVs began to slow down to the benefit of HEVs (with PGM content even higher than in conventional ICE-powered vehicles), which makes automakers revisit their transport electrification strategies.

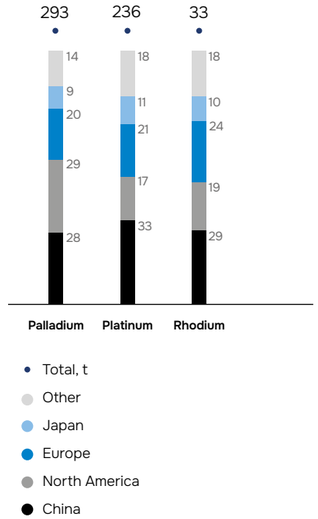
30 TONNES
Palladium market deficit in 2023

12 TONNES
Platinum market deficit in 2023

3 TONNES
Rhodium market deficit in 2023

Source: PGM balance estimate as of March 2024

PGM consumption by region, %



In 2023, palladium consumption in the automotive industry decreased by 1 tonne to 240 tonnes. The reason for sluggish demand for the metal in the automotive industry was that the minor increase in ICE-powered vehicle output was offset by residual palladium-with-platinum substitution in autocatalytic converters.

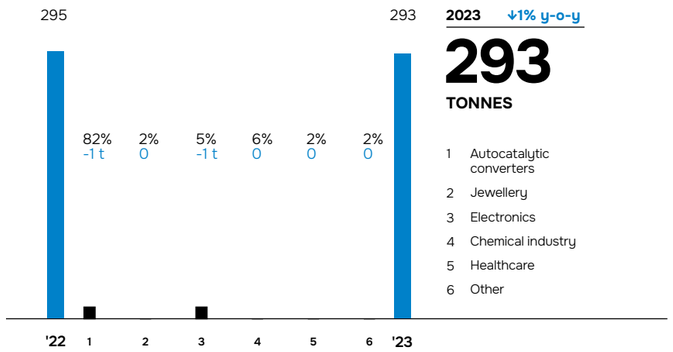
At the same time, palladium consumption in the automotive industry is supported by the declining share of diesel cars in the fleet mix as they are replaced with petrol cars and hybrids, which make greater use of palladium-based catalytic converters for exhaust fumes. The market share of diesel vehicles in Europe (27 EU countries + the UK + European Free Trade Association countries) dropped from 16% to 13% over the year. Despite the declining share of diesel vehicles, global demand for platinum from the automotive industry grew by 12 tonnes in 2023, driven by the recovery in production of trucks and residual substitution of platinum for palladium in petrol vehicles.

Rhodium consumption in this industry grew by 1 tonne amid a slight increase in vehicle production.

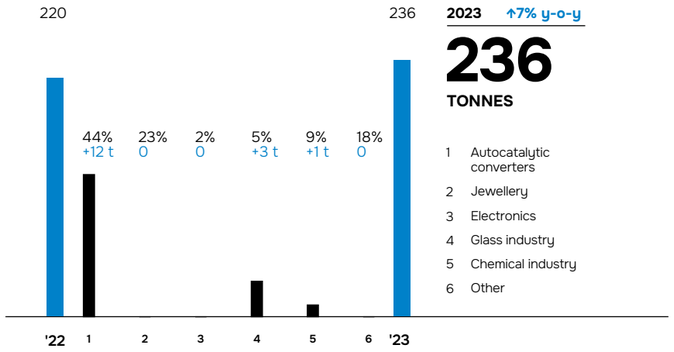
Electronics. Palladium has found its way into the electronics industry primarily as a material for capacitors and motherboards, while platinum is used in hard drives. In 2023, palladium consumption in the electronics industry decreased by 1 tonne to 16 tonnes on the back of weaker sales of household appliances. Platinum demand from the industry stayed flat at 5 tonnes.

Chemical industry. In 2023, the use of platinum in catalysts grew by 1 tonne to 21 tonnes amid the expansion of production capacities in China. Palladium demand in this industry remained at 19 tonnes.

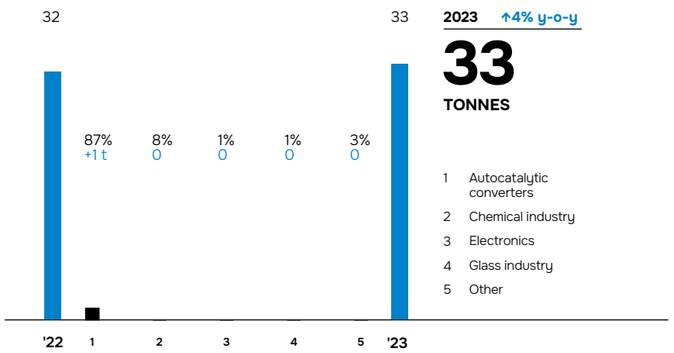
Palladium: consumption by industry, % and by application, T in 2023



Platinum: consumption by industry, % and by application, T in 2023



Rhodium: consumption by industry, % and by application, T in 2023



Healthcare. Palladium consumption in this industry decreased slightly, by 0.2 tonnes to 6 tonnes, driven by the long-term substitution trend, while demand for platinum stagnated at 8 tonnes.

Jewellery. The use of palladium and platinum in jewellery stayed flat at 5 tonnes and 54 tonnes, respectively. Although the macroeconomic uncertainty continues to put pressure on the demand for luxury goods in Europe and the US, jewellery sales growth in India offset the demand fall in developed economies.

Glass industry. Platinum containing products are needed to produce glass fibre and optical glass. Demand for the metal in this industry grew by 3 tonnes in 2023 as China expanded its production capacities.

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 2.1 tonnes to 16.0 tonnes in 2023, while platinum stocks decreased by 2.4 tonnes to 91.7 tonnes.

Supply

In 2023, primary refined palladium production decreased 1% y-o-y to 198 tonnes, while platinum and rhodium production grew 3% and 4% to 184 tonnes and 24 tonnes, respectively.

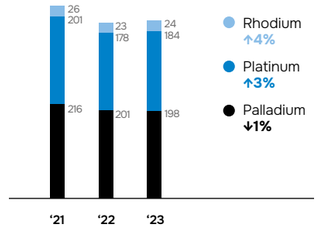
In Russia, the key palladium producer, palladium supply declined (by 3 tonnes) due to the transition to new mining equipment and scheduled maintenance at Nadezhda Metallurgical Plant and Talnakh Concentrator of the Norilsk Division. Platinum production stayed flat at 20.5 tonnes.

In 2023, South Africa, a key platinum and rhodium producer, saw its palladium, platinum, and rhodium output grow by 1 tonne, 5 tonnes, and 1 tonne to 75 tonnes, 133 tonnes, and 20 tonnes, respectively, – primarily because the shortage of smelting capacities was addressed.

Primary palladium and platinum production in Zimbabwe rose by 1 tonne to 14 tonnes and 17 tonnes, respectively, while rhodium output remained flat at 1.5 tonnes. Palladium production in the North America decreased by 1 tonne to 25 tonnes, while platinum production remained at 9 tonnes.

The main sources of recycled PGM supply are scrapped autocatalytic converters. In 2023, recycled palladium, platinum, and rhodium production decreased by 11 tonnes, 7 tonnes, and 1 tonne to 65 tonnes, 40 tonnes, and 7 tonnes, respectively. Such a noticeable decline in recycled supply was due to lower prices for PGMs, a tough monetary policy, stricter KYC policies in the US, and tightening of state regulation of the industry in China.

Primary PGM production, T



Source: Company data

2.1 TONNES

Increase in palladium inventories held by ETFs over 2023

2.4 TONNES

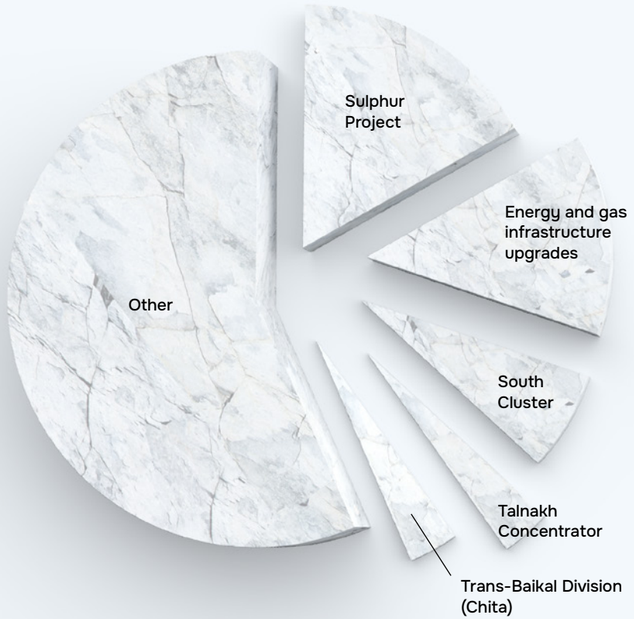
Reduction in platinum inventories held by ETFs over 2023

Strategic investment projects

Structure of the Company's investment programme
for 2023–2024

2023
3.0
USD BN

2024 (plan)
3.0–3.2
USD BN



The Company's key production projects

Sulphur Project at Copper Plant

Reduction in pollutant emissions in line with regulations

TOF-3

Boosting the capacity of Talnakh Concentrator to 18 Mtpa, improving nickel recovery rate

Sulphur Project at Nadezhda Metallurgical Plant

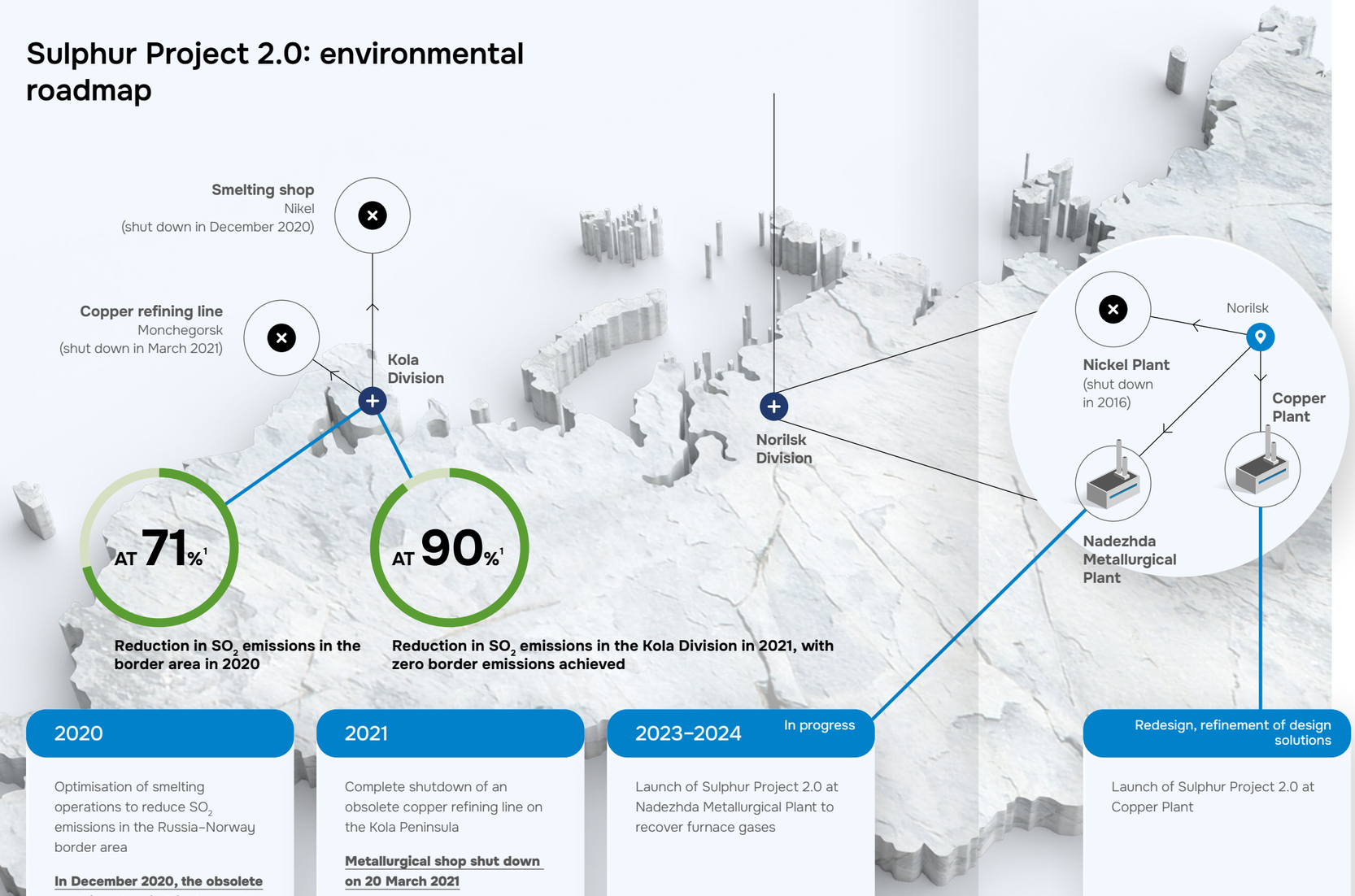
Construction of facilities to recover sulphur dioxide from furnace gases (sulphuric acid production and neutralisation lines) and associated infrastructure

Nickel refining at Kola MMC

Development of long-term solutions to improve performance and optimise the product portfolio

- In progress
- Redesign
- Pre-feasibility study

Sulphur Project 2.0: environmental roadmap



2020

Optimisation of smelting operations to reduce SO_2 emissions in the Russia–Norway border area

In December 2020, the obsolete smelting shop in Nikel was shut down

50%[1]
Reduction in SO_2 emissions in Nikel and Zapolyarny

2x

2021

Complete shutdown of an obsolete copper refining line on the Kola Peninsula

Metallurgical shop shut down on 20 March 2021

90%[1]
Reduction in total SO_2 emissions at the Kola Division facilities

7x

2023–2024 In progress

Launch of Sulphur Project 2.0 at Nadezhda Metallurgical Plant to recover furnace gases

45%[1]
Reduction in SO_2 emissions in the Norilsk Division once the design capacity is reached

~2x

Redesign, refinement of design solutions

Launch of Sulphur Project 2.0 at Copper Plant

up to 90%[1]
Reduction in SO_2 emissions in the Norilsk Division

10x

[1] From a 2015 baseline.

Sulphur Project 2.0: Norilsk Division

Nadezhda Metallurgical Plant

The Sulphur Project at Nadezhda Metallurgical Plant includes technological upgrades to recover SO_2 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 – practically non-hazardous waste to be placed in a gypsum storage facility.

2023 highlights:

- Construction of core and infrastructure facilities under the Sulphur Project at Nadezhda Metallurgical Plant
- Installation and pre-commissioning of process equipment
- Comprehensive testing of the first process line started in October 2023, first sulphur dioxide recovery

Sulphur Project 2.0 facilities at Nadezhda Metallurgical Plant are expected to ramp up to design capacity by the end of 2024

Copper Plant

The Sulphur Project at Copper Plant comprises the development and deployment of technology solutions to reduce SO_2 emissions from Copper Plant operations to the level specified by applicable standards and includes several interconnected initiatives. Amid external restrictions, the Company is taking comprehensive efforts to refine the design solutions to incorporate technology and equipment import substitution options.

2023 highlights:

- Survey and engineering works, refinement of design solutions to meet the need for import substitution of technology and equipment for core facilities
- Positive opinions of the Main Department of State Expertise (Glavgosexpertiza) and State Environmental Review Office were secured for several facilities following expert reviews of the design documents
- Priority upgrades were made as part of a retrofit project for the wet gas cleaning facility

South Cluster:
growing production volumes

Project summary

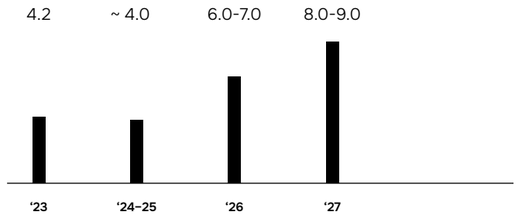
A large existing deposit with more than a 20-year reserve and resource life in the bottom quartile of the PGM cost curve.

137 MLN T[1]
Ore reserves

Project status

- In 2023, positive opinion of Glavgosexpertiza was secured.
- Deployment of an automated control system (ACS) for mine infrastructure facilities was completed.
- Energy infrastructure facilities are in the construction and pre-commissioning phase.
- Construction and development of the underground mine and related infrastructure are in progress.

Ramp-up to design capacity in 2023–2027, MLN T



2027–2028 mining targets

Ore	**9** mln t
Ni	**13+** kt
Cu	**20+** kt
PGMs	**750–850** koz

[1] Calculated to the JORC Code as at 1 January 2024.

Trans-Baikal Division

Project summary

One of the largest greenfield projects in Russia's mining industry. 50.01% owned by Nornickel. Life of mine: 27 years.

Project status

- In 2023, a new major strategic project was launched to upgrade the concentrator's milling section; utilities design documents for the mill construction project were developed and approved.
- Plans for 2024 include commissioning the first growth projects under the long-term strategy – magnetic separation capacity additions and a gold concentrate dehydration unit.

283 MLN T[1]
Ore reserves, grading:
Cu ~0.53% **Fe** ~18.67% **Au** ~0.66 g/t

USD 963 MLN
2023 EBITDA

15 MLN T
Production in 2023, with
0.63% **Cu** content

Production volumes		2023	2024E
Cu in concentrate	kt	69	64-68

Upgrade of Talnakh Concentrator: Stage 3

Project summary

Major capacity expansion based on proven technology to process growing Talnakh ore volumes and unlock strategic optionality of the South Cluster development project.

Project status

- In 2023, the installation of metal frames of ore dressing units and ore feeders was 90% complete, installation of supports for the process equipment is in progress.
- Installation of reinforced concrete and metal structures is in progress. Foundations for process equipment were built.
- Groundworks at power supply and water recycling facilities were completed.
- Plans for 2024 include completing the installation of metal frames and fences for ore dressing units and ore feeders as well as the bulk of process equipment installation works.

Projected implementation timeline[1]

Commissioning date is to be confirmed as it depends on the projected ore production schedule.

8 MTPA
Capacity additions

4%–7%
Expected increase in metal recovery

[1] Subject to import substitution of flotation equipment and the target delivery schedule being met.

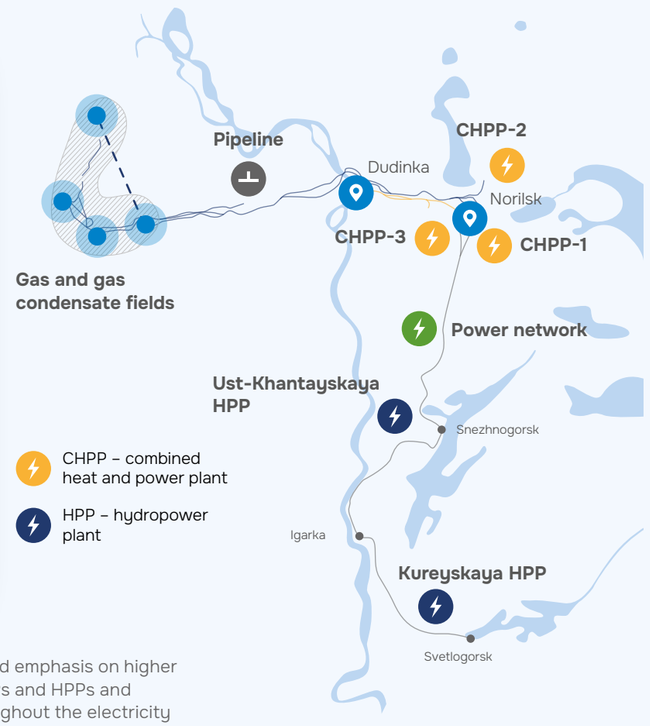
Energy infrastructure upgrade programme

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

Gas and gas condensate exploration, production, and transportation

- Drilling of five new gas wells at the Pelyatkinskoye gas condensate field.
- In 2023, the bulk of construction and installation works was completed as part of retrofitting a gas pipeline's underwater crossing of the Bolshaya Kheta River.
- In 2023, stage one of retrofitting the Tukhard–Messoyakha–Yuzhno-Soleninskoye–Severo-Soleninskoye methanol pipeline was completed.
- In 2023, at the Severo-Soleninskoye gas condensate field, construction and installation of a booster compressor station were completed, with the station now at the pre-commissioning stage.

Energy infrastructure



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

Combined heat and power plants

Revamps of Units Nos. 1 and 2 at NTEC's CHPP-2. The new Unit No. 1 was commissioned.

The core equipment of Unit No. 2 of CHPP-2 was completely installed in 2023 and is scheduled for commissioning in 2024.

Also in 2023, three tanks at CHPP-1 and CHPP-2 were installed, and the installation of a tank at CHPP-3 is nearing completion.

Logistics Infrastructure Development Programme

Programme rationale

Growing eastbound shipments of construction equipment and raw materials as the investment programme is entering its active phase, and growing westbound shipments of intermediate products as projects move to the post-investment phase

Accelerated pace of production equipment upgrades

Expansion of Northern Sea Route operations and increased freight volumes for major investment projects of other players using the route in the Russian Arctic

The Company owns Dudinka Port, which is Taimyr's main cargo gateway with no reasonable alternative