

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

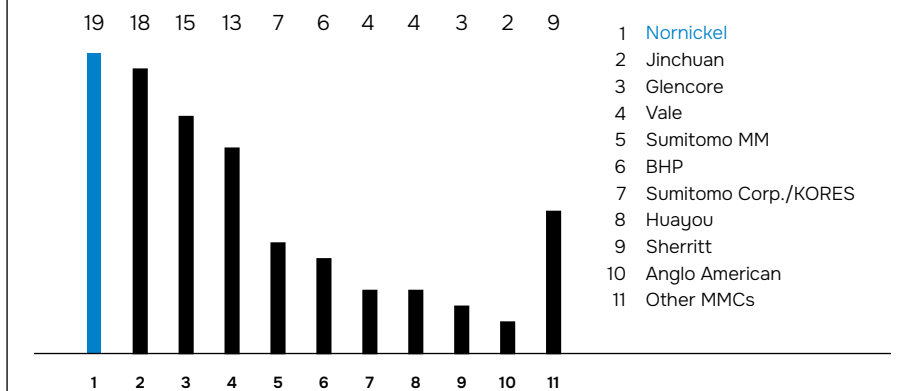
Nickel surplus persisted in 2023, exceeding 200 kt (compared to 113 kt of surplus in 2022), mostly in the low-grade nickel market. However, the high-grade exchange nickel market remained balanced as the inflow of metal to exchange warehouses was insignificant while alloys and specialty steels continued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

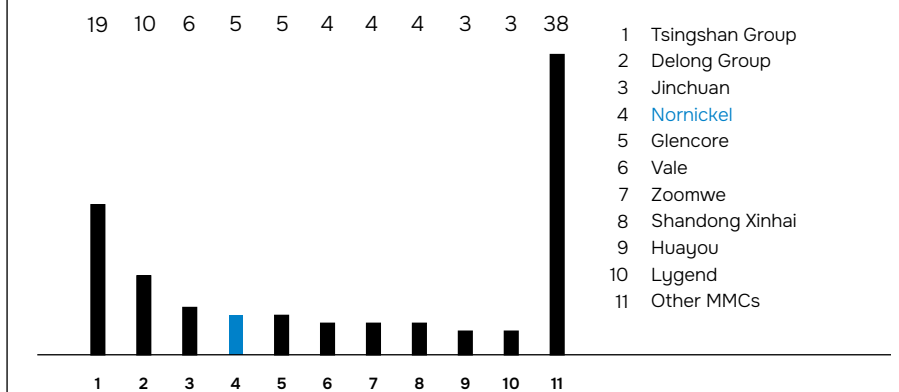
Early in the year, the price exceeded USD 31,000/t but dropped to USD 22,000/t in mid-March triggered by news that some Chinese nickel producers were considering launching production of nickel cathodes in China and Indonesia as early as in 2023. Another headwind was weak domestic demand in China amid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

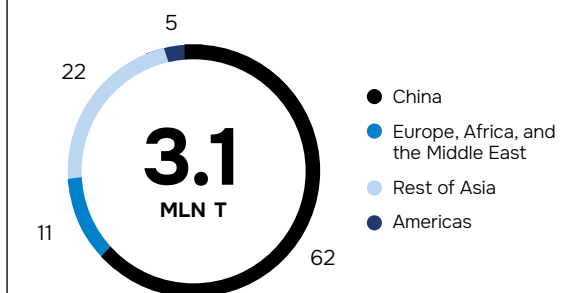
Nornickel – No. 1 in Class I nickel production, %¹



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