Organisation for Economic Co-operation and Development

DSTI/SC(2025)15/FINAL

Unclassified **English - Or. English**

15 January 2026

DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INNOVATION
STEEL COMMITTEE

FINAL - Annual market and policy report on steelmaking raw materials

2025 Edition

This document was authored by Luciano Giua, Gianpiero Mattera and Juliana Gonzalez from the OECD Secretariat. It was approved and declassified by the OECD Steel Committee on 05/11/2025 and prepared for publication on the O.N.E. platform by the OECD Secretariat.

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JT03579428

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Executive summary

This document maps recent market developments and policy actions shaping the availability of three important steelmaking inputs, namely, ferrous scrap, chromium and nickel. The report shows how concentration in production and exports of these raw materials may increase dependencies for OECD steel-producing economies. These vulnerabilities are further compounded by the rising use of export restrictions, which can tighten global availability, increase price volatility, and heighten risks of supply disruption. Future documents will cover other raw materials.

The key risk in the ferrous scrap market lies in uneven availability across regions, which creates structural import dependence for many developing economies. While mature economies tend to collect large volumes of scrap and operate efficient recycling infrastructure, emerging economies often face chronic deficits and rely heavily on imports. This imbalance is significant given that ferrous scrap is a central input for steelmaking and a cornerstone of near-term decarbonisation strategies, particularly through electric arc furnaces (EAFs). Meeting these objectives will require a material increase in global scrap availability over the coming decades.

For chromium, the key risks stem from extreme resource and production concentration. Almost all chromite resources are located in South Africa, Zimbabwe and Kazakhstan, while the People's Republic of China (henceforth, "China") dominates ferrochrome production despite having almost no ore of its own. This structural imbalance makes global stainless steel supply highly sensitive to both policy shifts and production disruptions in a handful of countries. Over the past decade, Chinese investment has reshaped the chromium value chain, financing new smelting projects in Zimbabwe and South Africa and securing long-term access to ore through offtake agreements and joint ventures. At the same time, South African smelting capacity has contracted due to rising costs and infrastructure constraints, increasing the share of raw ore shipped abroad. The combination of resource concentration, growing Chinese control over processing, and reduced diversity of supply heightens strategic vulnerabilities for stainless steel producers outside these hubs. Trade flows are increasingly shaped by Chinese demand and investment decisions, raising the risk of price volatility and long-term dependency on a handful of suppliers and investors.

The nickel market is defined by rapid expansion of the Indonesian nickel industry, which has transformed the country from a raw ore exporter into the dominant global hub for nickel pig iron, ferronickel, and increasingly battery-grade intermediates. This surge, driven by export bans and large-scale Chinese investments, has reshaped global supply dynamics: while Indonesia continues to add nickel capacity in recent years, production in other regions has contracted under pressure from low prices and shrinking margins. At the same time, other major non-OECD producers have introduced fiscal measures, export taxes, or outright prohibitions on unprocessed nickel ore, with the stated objective of fostering greater domestic processing. The combined effect has been a reduction in the trade of raw nickel ore, increased reliance on a limited number of suppliers, and heightened risks of price volatility and supply insecurity for downstream industries, particularly stainless steel.

1 Introduction

The steel sector depends on a wide array of raw materials to sustain its production processes, encompassing both traditional inputs such as iron ore and metallurgical coal, as well as secondary materials like ferrous scrap. In addition, alloying and quality-enhancing materials such as ferromanganese, chromium, and nickel play an essential role in steel production. Each of these materials serves a critical function at various stages of the steel value chain, from primary ironmaking to advanced steel finishing. However, few economies possess the natural resource endowments or industrial capacity to supply the full spectrum of these materials domestically, making the global steel industry inherently reliant on international trade.

In recent years, however, export restrictions on steelmaking raw materials have become more frequent and far-reaching. Ores and minerals, including nickel and chromium, have seen the most rapid increase in restrictions, especially since 2021, often aimed at promoting domestic processing (OECD, 2025[1]) Such trade restrictions not only have the potential to disrupt the global steel sector but they may also have ripple effects on downstream industries that manufacture steel-based products, with potentially significant implications for broader economic activity. Given the pervasive use of steel across key industries, including construction, automotive, machinery, and infrastructure, any disruption in raw material availability can translate into production bottlenecks, increased costs, and economic slowdowns in both industrialised and developing economies.

As part of the 2024-25 programme of work of the OECD Steel Committee [DSTI/SC(2024)12/REV3], this report aims to provide timely intelligence on market dynamics and policy measures shaping the availability of steelmaking raw materials. **The report's objectives are threefold[1]: 1) to identify early signals of supply chain risks through analysis of recent trade and production data across a selected range of key steelmaking inputs; 2) to assess specific vulnerabilities and dependencies within steel supply chains; 3) and to deliver up-to-date monitoring of policy developments that could impact the global flow of essential raw materials for steel production.**

Why is it important to monitor steelmaking raw materials?

Steel production relies heavily on the availability and strategic use of key inputs such as steel scrap, chromium, and nickel. These materials are critical not only for improving the mechanical and chemical properties of steel, but also for enhancing production efficiency and supporting decarbonisation goals. For example, maximising the use of steel scrap in secondary production through electric arc furnaces is widely recognised as one of the most effective and commercially available levers for decarbonising steel production, although challenges remain (OECD, 2024[2]). Scrap-based steelmaking emits less CO_2 than primary routes and requires far less energy, offering an immediately available pathway to lower carbon intensity.

However, a growing interest in scrap-based production has led to concerns over the security of supply, particularly as some countries have introduced export restrictions on steel scrap to preserve domestic availability or control prices. Such measures can distort international markets, provide artificial support to domestic steel producers that benefit from lower domestic scrap prices, limit the efficient allocation of resources, and constrain the ability of other economies to transition toward lower-emission production routes.

Chromium and nickel are critical to a wide range of industrial and strategic sectors and are essential alloying elements in stainless steel, each contributing distinct properties critical to its performance and durability. Without chromium and nickel, stainless steel simply cannot be produced—chromium is what gives it its defining corrosion resistance, while nickel enhances its strength, ductility, and stability under extreme conditions. The strong rebound in global stainless steel production in 2024—up 7% year-on-year to 62.621 million tonnes—highlights not only the growing demand for these inputs but also their strategic importance (GMK Center, 2025[3]).

As stainless steel demand accelerates, so does demand for the raw materials required to produce it, intensifying competition among steelmakers and with other industries for limited supply. Yet both chromium and nickel are subject to supply risks due to their geographic concentration and exposure to geopolitical tensions. Rising demand combined with these supply risks can introduce volatility and uncertainty in global markets, particularly for countries dependent on imports. In this context, ensuring stable, transparent, and diversified supply chains on a level playing field for chromium and nickel is essential to sustaining stainless steel production and avoiding downstream disruptions across multiple strategic industries.

These dynamics point to a broader risk of strategic dependency, whereby a small number of suppliers can determine the cost and availability of essential inputs. Heightened geopolitical tensions and growing trade distortions—including export restrictions and other forms of trade barriers — are prompting governments and firms to re-evaluate sourcing models. Responses now range from supplier diversification and "friend-shoring" to strategic stockpiles, long-term offtake agreements, investments in recycling and substitution, and upstream partnerships in resource-rich countries.

While these actions can strengthen resilience, they may also reconfigure trade flows, raise short-term costs, and shift risks along the value chain. In this context, a **systematic monitoring** – which includes systematic and forward-looking analysis of market trends, trade measures, and policy developments - becomes crucial to help governments and industry anticipate bottlenecks, design appropriate mitigation strategies, and ensure that the steel sector remains resilient and competitive.

Box 1. OECD work beyond the Steel Committee on critical minerals and raw materials

Beyond the Steel Committee, the OECD's work on critical minerals focuses on promoting good governance, responsible mining, and circular economy principles to support sustainable critical mineral value chains (OECD, 2025[4]). It does this by combining policy analysis, international standards, and country-level studies to improve governance across the full critical minerals' life cycle - from exploration and mining to processing, trade, and use.

The Trade and Agriculture Directorate (TAD) hosts, since 2009, the OECD Inventory of Export Restrictions on Industrial Raw Materials – tracking export restrictions of various types (e.g. export taxes, licensing requirements, export prohibitions) across a wide range of materials and producing economies. Its work on raw materials focuses on the economic analysis of production, trade, and export restrictions, with the objective of understanding how such measures influence availability, dependencies, and the conditions for the green transition.

A central vehicle is the OECD Initiative on Critical Minerals for Sustainable Growth and Development, which mobilises nine Directorates to deliver two pillars: (i) tailored policy analysis and capacity building, including country projects and regional assessments, and (2) regional dialogues that convene mineralrich and importing countries across Africa, Latin America, Eurasia, and Southeast Asia to address challenges, align development objectives, and identify collective actions.

This OECD work underscores three points: (1) scaling up supply and recycling to meet increasing demand from clean energy, digital technology and defence will mean that countries at all stages of development have a role to play in reducing pressure on primary extraction, through recycling and by increasing the supply of secondary raw materials; (2) Robust, transparent policy, tax, and legal frameworks are crucial to diversify supply, reduce risk, and turn mineral wealth into quality jobs, community well-being, investment, and infrastructure; and (3) OECD Member and partner countries need to work together to ensure sustainable mining practices.

Remainder of the paper

The remainder of this report is structured as follows. Sections 2 to 4 will document recent market developments along with the most recent policy actions affecting the three different materials/products, notably ferrous scrap, chromium and nickel. Section 5 provides a comparative policy perspective and Section 6 concludes.

2 Ferrous scrap

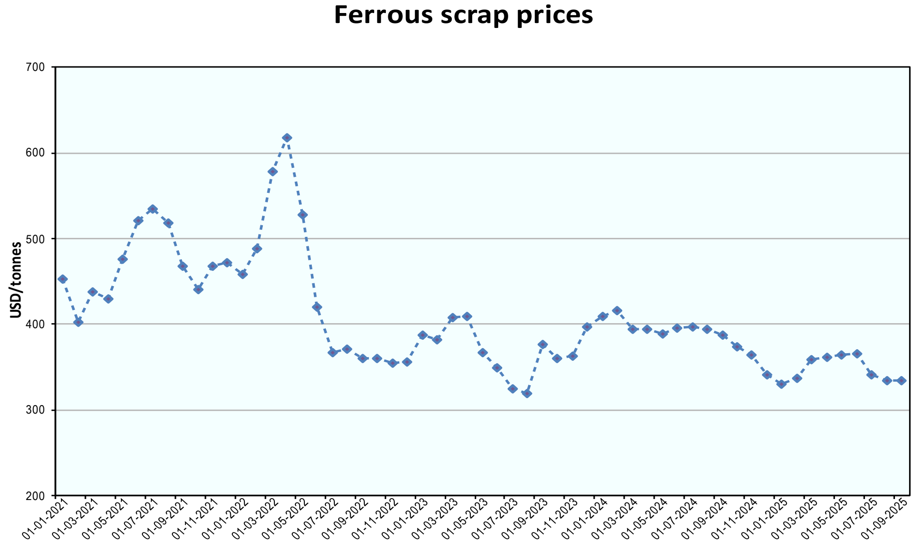
Steel scrap is an essential raw material for the steel industry, enabling cost-effective and energy-efficient production while supporting the circular use of resources. Scrap is an essential component of the metallic charge in basic oxygen furnaces (BOF) and a key input for making steel through electric arc furnace (EAF) production mode. While it is a cost-effective and practical material ensuring circularity of production, it is also an important material for decarbonising the sector. Currently, scrap accounts for approximately 30% of the metallic feedstock used globally, but this ratio is likely to rise in the years and decades ahead if steel producers shift their technologies increasingly towards EAF production. However, the OECD warns that scrap availability is highly uneven across regions, reflecting disparities in industrial maturity and recycling infrastructure (OECD, 2024[5]).

Areas with high steel consumption — such as North America, Europe, East Asia and China — have relatively abundant scrap supplies, while emerging markets may face chronic shortages. Although not apparent according to the latest export restrictions measures applied to scrap, this geographic heterogeneity could spur trade tensions, especially if major suppliers start imposing export restrictions to safeguard domestic supplies.

Recent scrap market developments

Global use of *ferrous scrap* mimics global patterns of *steel* consumption, particularly past consumption of steel-intensive goods, with China being the world's largest scrap consumer, and the European Union and the United States ranked second and third largest consumers of this material, respectively. **The current outlook indicates that the scrap market remains relatively stable, with slight price declines across geographies since the beginning of the year 2025, mainly due to limited demand from steelmakers, logistical difficulties, and currency fluctuations.** In September 2025, scrap prices fell by 14% year-on-year (See Figure 1), mainly due to substitution. Importers such as Viet Nam, India, Bangladesh and Türkiye shifted from scrap to cheaper Chinese billet and DRI (Reuters, 2025[6]).

Figure 1. Ferrous scrap prices



Note: The scrap price series is Platts "Scrap / Shredded / N.Europe domestic delivered UDS /t"
Source: S&P Global Commodity Insights, LSEG.

Asia

China remains the world's largest scrap user by volume, but its scrap usage has stagnated relative to crude steel production In 2024, **China** experienced a slight 2.1% dip in scrap usage to 164 Mt (BIR, 2025[7]), which aligns with broader data showing China's steel demand is flattening (OECD, 2025[8]). However, the government of China remains committed to boosting scrap use — the latest five-year plan targets over 300 million tonnes (Mt) by 2025 (SMM, 2021[9]), and import restrictions were recently eased to support green steel expansion (Ministry of Ecology and Environment, 2025[10]). However, in early 2025, scrap use continued to stagnate: crude steel production in the first quarter grew slightly (+0.6 % y-o-y to 259.3 Mt), but scrap use decreased by 1.6% to 57.6 Mt, confirming that the goal to substitute iron ore with scrap is not keeping pace with production growth (BIR, 2025[11]).

By contrast, economies like India and Türkiye experienced a marked increase of ferrous scrap use in 2024. **India**, for instance, saw scrap use surging over 10% in 2024 driven by infrastructure projects, rising EAF adoption, and supportive policies. Robust domestic steel output growth also drove this higher scrap usage. Scrap imports also surged 40% in 2024 to 11 Mt, making India the second-largest scrap importing country after Türkiye. In early 2025, this momentum carried forward: scrap use rose by nearly one-fifth year-on-year in the first quarter alone, outpacing crude steel growth. This acceleration underscores a strong structural shift towards scrap-based steelmaking, supported by government initiatives and favourable market dynamics (BIR, 2025[11]).

Table 1. Scrap use by economy

Million tonnes (2024 Q1 vs 2025 Q1)

Economy	Steel scrap Consumption Jan-Mar 2025	Steel scrap Consumption Jan-Mar 2024	% Change
China	57.62	58.55	-1.6
EU-27	19.05	20.51	-7.1
USA	13.02	15.30	-14.9

Japan	7.40	8.03	-7.8
India	10.60	8.45	19.1
Türkiye	7.24	7.32	-1.0
Korea	4.82	6.12	-25.1

Source: Bureau of International Recycling.

Europe

In the European Union, steel scrap use fell more sharply than steel output in early 2025. While EU crude steel production declined by 2.5% year-on-year in the first quarter, scrap consumption contracted by 7.1% to 19.1 Mt. Similar patterns were observed across other advanced steelmaking economies, suggesting that subdued industrial demand and lower utilisation rates in EAFs, which tend to adjust output more rapidly during downturns, drove the sharper decline in scrap use (BIR, 2025[11]).

The Turkish steel industry uses significant amounts of scrap (23.6 Mt in 2024), with imports representing around 80% of its scrap total consumption, the highest proportion among major players. In 2024 Turkish steelmakers imported about 20 Mt of ferrous scrap, with the US being the top supplier (about 4.53 Mt, i.e. a 22.6% import share). However, in the first quarter of 2025 scrap consumption edged slightly lower (-1.0% to 7.24 Mt), in line with a 3.4 % dip in crude steel output to 9.3 Mt. Imports also contracted in early 2025 (-11.5 % y-o-y to 4.72 Mt), reflecting softer demand conditions. A large share of scrap imports in total scrap use (Table 2) indicates strategic dependence on external markets (in particular the United States and the EU), which could heighten supply risk for Türkiye's steelmaking operations if trade patterns were to change markedly.

Table 2. Significant import shares shed light on possible dependency risks

Economy	EAF capacity share 2023	Scrap use (Mt) 2024	Scrap import (Mt) 2024
China	13.4%	218.7	0.5
EU	43.0%	78.1	3.9
USA	70.4%	54.9	5
Japan	31.0%	31.2	0
India	29.0%	34.0	11.7
Türkiye	77.0%	31.4	18.7
Korea	36.0%	22.3	3.8

Note: Data on ferrous scrap trade are obtained from ISSB and include the following HS codes (6 digit): 720410, 720421, 720429, 720430, 720441, 720449, 720450. Data on scrap use are obtained from BIR. Reported scrap use corresponds to the period January–September 2024 . For comparability, figures have been annualised (Jan–Sep values divided by 9 and multiplied by 12). EAF capacity shares are obtained from the OECD steelmaking capacity dataset. Data refer to 2023.

North America

In North America, steel scrap consumption fell more steeply than steel output in early 2025. US crude steel production was broadly flat in the first quarter (-0.6 % y-o-y to 19.7 Mt), but scrap use contracted by 14.9 % to 13.0 Mt. This divergence suggests a temporary reduction in scrap-intensive production, likely reflecting weaker demand in key downstream sectors. Despite the slowdown, the United States remained one of the world's largest scrap exporters, shipping 2.9 Mt abroad in Q1-2025, mainly to Türkiye, India and Mexico (BIR, 2025[11]).

Policy actions

Global policy assessment

Over the past few years, there has been an increase in the application of export restrictions to ferrous scrap, which provides a sign of the increased importance of ferrous scrap to certain economies as an input for their steelmaking operations.

According to the OECD Inventory on Export Restrictions on Industrial Raw Materials, in 2023, 42 economies applied some form of restriction on ferrous scrap (OECD, 2025[12]). These include several large steelmaking economies — such as China, Egypt, Indonesia and India — as well as a wide range of smaller markets. However, when comparing these measures against export volumes at the HS 6-digit level, only about 15.2% of global scrap trade was actually subject to restrictions. Among the world's major exporters, only India currently maintains an active measure (India Code, 2023[13]), indicating that while restrictions are widespread in number, they still cover a rather limited part of global scrap trade flows (see Table 3).

While scrap export restrictions affect only a small share of global trade, their growing number is a cause for concern. The spread of such measures, particularly among developing economies, signals rising competition for scrap which could tighten availability in the medium term for steelmaking countries that depend on imports.

Table 3. Active export restrictions on ferrous scrap (major exporters)

Economy	Scrap exports (Mt)	Share of global exports (%)	Number of export restrictions currently in force
EU	22.9	17.2	0
USA	21.4	16.0	0
TUR	19.0	14.3	0
IND	11.8	8.8	1
GBR	7.5	5.7	0
JPN	7.0	5.2	0
CAN	5.6	4.2	0
VNM	5.2	3.9	1
KOR	4.2	3.1	0
MEX	3.7	2.8	0
TWN	3.5	2.6	0
PAK	2.5	1.9	0
AUS	2.2	1.6	0
THA	1.9	1.4	0
CHE	1.1	0.9	0
IDN	1.1	0.9	2
BRA	1.1	0.8	0
HKG	1.1	0.8	0
RUS	1.1	0.8	1
MAR	1.0	0.8	1
CHN	0.0	0.0	1

Note: Data on ferrous scrap trade are obtained from ISSB and include the following HS codes (6 digit): 720410, 720421, 720429, 720430, 720441, 720449, 720450. Data on export restrictions are obtained from the OECD Export restrictions on critical raw materials database and complemented by desk research carried out by the Steel Secretariat. EU data do not include EU intra trade.

Recent policy actions related to scrap

In May 2024, China's State Council issued the "2024-2025 Energy Conservation and Carbon Reduction Action Plan", which included measures for the steel sector aimed at increasing the share of electric-arc furnace steel to 15% of crude steel production (the share was 10.2% in 2024) and raising steel scrap use to 300 Mt by 2025. In line with these objectives, on June 9, 2025, China's Ministry of Ecology and Environment, jointly with five other ministries, issued Announcement No. 14 to redesign how recycled steel materials—alongside recycled battery black powder—are treated at customs. The shift significantly reduces administrative burdens on importers, streamlining trade flows in high-quality recycled steel. The policy highlights China's strategic push to increase recycled material use, support its transition to electric-arc-furnace-based steelmaking, and reduce CO2 emissions.

South Africa has progressively tightened controls on scrap metal exports in recent years. A temporary export ban on ferrous and copper scrap was imposed between June and December 2023, as part of a government package to curb metal theft and ensure local supply availability (Government of South Africa, 2023[14]). Since February 2025, the regime has shifted to a licensing system: exports of ferrous scrap (HS 7204) now require a permit from the International Trade Administration Commission (ITAC), with stainless steel scrap added to the permit requirement in March 2025. These measures aim to secure domestic scrap availability for South Africa's steel industry while maintaining a regulated framework for international trade.

Viet Nam is one of the world's largest importers of steel scrap, and rising inflows have raised concerns over poor quality shipments, environmental risks, and weak domestic recycling capacity (Viet Nam News, 2017[15]). In response, the Ministry of Industry and Trade suspended temporary import and re-export trade of scrap for 2025-29 to curb speculative flows and reduce risks of contaminated material. Shortly after, in January 2025, the Ministry of Natural Resources and Environment issued new technical standards for imported scrap covering iron and steel as well as plastics, paper, glass and non-ferrous metals. These regulations are intended to ensure that scrap used by industry is clean, properly classified, and traceable, while gradually encouraging Viet Nam to develop its own recycling systems and reduce dependence on imported material.

To reduce reliance on imported scrap, the government of India has recently formulated a strategy to expand domestic scrap generation (Steelorbis, 2025[16]). The Steel Ministry in 2025 proposed an interdepartmental coordination body and incentives to improve scrap collection from industries like automobiles, machinery, and consumer goods. The recent vehicle scrappage initiative, initially implemented in 2021 and entered in full force in 2024, mandates that commercial vehicles older than 15 years and private vehicles older than 20 must pass a fitness-and-emissions test or be classified as End-of-Life Vehicles and deregistered. These efforts come amid global moves to securing raw material for India's growing EAF-based steelmaking and decarbonisation goals (Impact and Policy Research Institute, 2024[17]).

In March 2025, the European Commission presented the European Steel and Metals Action Plan, which includes several measures that could affect scrap markets. The plan signals growing concern over rising EU scrap exports, which reached record levels in recent years, and sets out steps to retain more material within the European Union. By the third quarter of 2025, the Commission will decide whether to introduce a trade action (potentially including a reciprocity rule) aimed at securing domestic scrap supply. In addition, the revised Waste Shipment Regulation provides stricter conditions on exports to third countries. Looking further ahead, the Commission announced that the forthcoming Circular Economy Act (2026) will examine options such as export fees or duties, and may introduce recycled-content targets in sectors like automotive and construction (European Commission, 2025[18]).

Table 4. Major ferrous scrap related policy developments

Jurisdiction	Policy	Effect	Announcement date	Source
China	2024-2025 Energy Conservation and Carbon Reduction Action Plan	The policy, issued by China's State Council, outlines clear policy support for scrap use in steelmaking and promotes scrap recycling.	24 May 2024	(State Council, 2024[19])
China	Announcement on Matters Concerning the Regulation of the Administration of the import of recycled materials.	The policy will help better treat standardized recycled steel as a non-waste commodity, allowing it to be freely imported under designated HS codes with less restrictive customs inspections.	10 June 2025	(Ministry of Ecology and Environment of the PRC, 2025[20])
South Africa	Export licensing requirement on ferrous scrap	Since February 2025, exports of ferrous scrap require a permit from the International Trade Administration Commission (ITAC). The measure was extended in March 2025 to cover stainless steel scrap (HS 7204.21), closing a previous exemption.	6 Feb 2025	(South African Revenue Service, 2025[21])
Vietnam	Suspension of temporary import, re-export, and merchanting trade of scrap materials	Prohibits temporary importation and re-export of a wide range of scrap (including iron and steel HS 7204, copper, aluminium, nickel, zinc, tin) for the period 1 Jan 2025–31 Dec 2029. Aims to tighten environmental protection, ensure quality control, and safeguard economic security.	8 October 2024	(Vietnam Customs, 2024[22])
Vietnam	New national standards on imported scrap	Sets environmental and quality standards for imported scrap (iron and steel, plastics, paper, glass, non-ferrous metals). Aims to tighten controls while meeting industry demand.	14 Jan 2025	(Ministry of Agriculture and Environment, 2025[23])
India	Strategy to expand domestic ferrous scrap generation	Established a framework for scrap centres to process ferrous scrap, supported by MoRTH's Vehicle Scrapping Policy and MoEF&CC's waste management rules.	15 Mar 2023	(Ministry of Steel, 2023[24])
European Union	European Steel and Metals Action Plan	The plan tightens conditions on extra-EU scrap exports and foresees possible trade measures by late 2025. Longer-term plans under the Circular Economy Act in 2026 may introduce additional restrictions such as export fees or duties.	19 Mar 2025	(European Commission, 2025[18])

3 Chromium

Chromium is an essential raw material for the steel industry, particularly in the production of stainless and alloy steels. It improves resistance to corrosion, increases hardness and allows steel to withstand high temperatures. Stainless steel cannot be produced without chromium: it must contain at least 10.5% of the element by mass to form the protective oxide layer that gives the steel its durability (Eurofer, 2016[25])

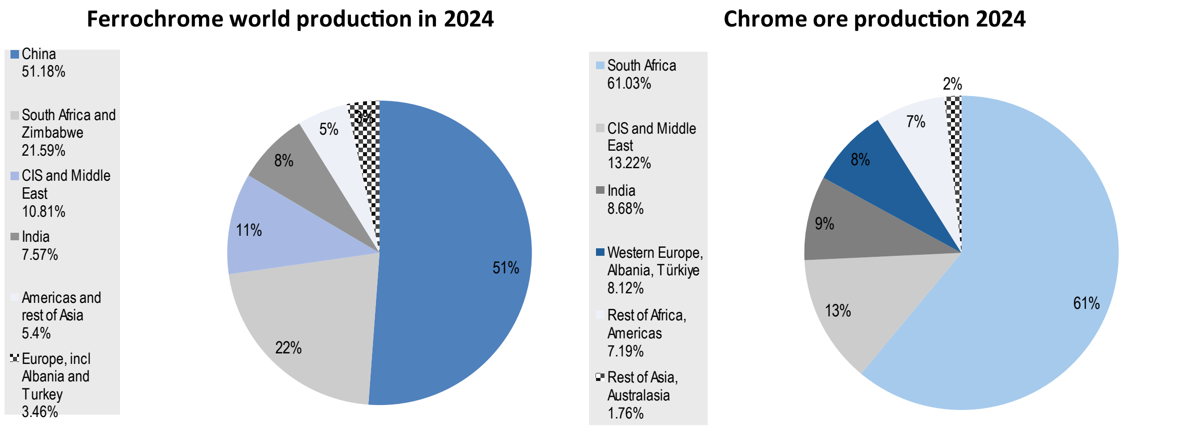
The chromium value chain begins with chrome ore, which undergoes beneficiation to increase its grade. The ore is then smelted into ferrochrome, the main form by which chromium enters steelmaking. Around 90% to 95% of mined chrome ore is converted into ferrochrome, and the stainless-steel sector accounts for 80 to 90% of global ferrochrome use (du Preez et al., 2023[26]). World chromium resources are geographically concentrated in Zimbabwe, Kazakhstan and South Africa which together represent around 90% of the world's resources. China overtook South Africa as the world's largest ferrochrome producer in 2012, and by 2014 it was firmly established as the global leader (ICDA, 2025[27]). This development was driven not only by the rapid expansion of domestic smelting capacity, but also by sustained overseas investment, as Chinese enterprises—frequently state-backed and operating within the framework of the Belt and Road Initiative—acquired chromite and ferroalloy assets in Zimbabwe and South Africa to secure long-term access to raw materials (See Box 3).

The high concentration of chromite resources in a few countries, together with China's dominant role in ferrochrome production based on imported ore, raises concerns about supply dependencies. Recurrent electricity and infrastructure constraints in South Africa, as well as policy measures in Zimbabwe such as export restrictions and beneficiation requirements, further increase the exposure of global stainless-steel supply chains to market and regulatory risks.

Recent market developments

In 2024, global chrome ore production reached an estimated 47 million tonnes an approximate 4% increase from 2023. South Africa remained the leading producer and exporter of chrome ore globally, accounting for an estimated 45% of total world mining production. Other major producers included Kazakhstan with 6.5 million tonnes, Türkiye with 8 million tonnes, and India, which maintained stable output at 4.1 million tonnes (USGS, 2025[28])

Figure 2. Chrome ore and ferrochrome world production shares in 2024

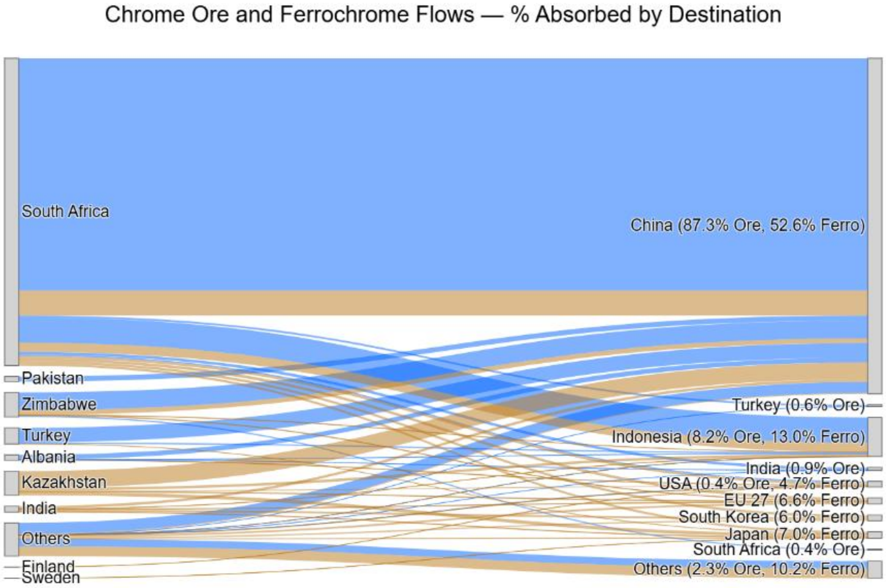


Source: Source: (ICDA, 2025[29])

In 2024, the total world production of ferrochrome was estimated at around 18.5 million tonnes, a 15% increase from 2023 (International Chromium Development Association, 2025[30]) and more than half of ferrochromium was produced in China, despite having virtually no domestic chrome ore mining capacity and relying almost entirely on imported raw materials (Xiang et al., 2025[31]). This reliance has shaped trade flows, with South Africa, Zimbabwe and other producers serving as key suppliers to Chinese smelters (see Figure 3). At the same time, oversupply in China's stainless-steel sector also propelled ferrochrome production, a situation that further contributed pushing ferrochrome prices down in 2024 (USGS, 2025[28]),

High-carbon ferrochrome (typically 65–70% chromium, 6–8% carbon) experienced a sharp price decline from mid-2024 to early 2025, driven by record production in Inner Mongolia that created a supply surplus against softer stainless steel demand, falling from about USD1.80/lb to USD1.30/lb, before stabilising and recovering modestly by mid-2025 (Fastmarkets, 2025[32]) (Shanghai Metal Market, 2025[33]). In contrast, lower-grade ferrochrome with around 50% chromium content, heavily imported into China, declined more gradually to about USD 0.80/lb before rebounding above USD 1.00/lb in 2025 (Fastmarkets, 2025[32]). This divergence mostly reflects China's central position in the ferrochrome market, as shifts in Chinese demand directly influence global trade flows and price dynamics.

Figure 3. Global Chrome Ore (Blue) and Ferrochrome (Brown) Trade Flows in 2024



Source: ISSB, trade data in volumes.

Box 2. A snapshot of the stainless-steel global market in 2025

Stainless steel production is a major driver of global demand for critical raw materials, particularly chromium and nickel, which are essential alloying elements in stainless steel grades. As such, trends in stainless steel demand directly affect the consumption and pricing of these inputs. Conversely, distortions in the markets for chromium and nickel, including trade restrictions, market concentration, or state interventions, can ripple through the stainless steel value chain, affecting production costs, investment decisions, and long-term industry competitiveness. (Straits Research, 2023[34])

Currently, stainless steel accounts for about 8% of total global steel production (Outokumpu, 2025[35]). In 2024, stainless steel melt shops' production[2] increased by 7% y-o-y reaching a total of 62.6 million metric tonnes. This growth was primarily driven by strong output in China, which accounted for over 63% of global production, reaching 39.4 Mt (+7.5%). The United States recorded the second-fastest growth rate at +6.9%. In contrast, Europe saw only modest growth (+1.5%), indicating ongoing structural challenges and a slower demand recovery. On a quarterly basis, output rose steadily throughout the year, peaking in Q4 at 16.5 Mt, signalling positive production momentum entering 2025 (Worldstainless, 2025[36]).

Global stainless steel consumption is forecast to grow by 4.0% in 2024 and 3.0% in 2025, building on 3.2% growth in 2023. Regionally, Asia (excluding China) is expected to lead demand growth in 2025 with a 5.3% increase, while China continues to slow down, with growth expected to ease to only 2.6% in 2025. Consumption in the Americas, Europe and Arica continues to rise moderately, suggesting a gradual stabilisation of demand, particularly in flat products, aided by inventory normalisation and modest improvements in downstream sectors (Worldstainless, 2024[37]).

Despite the apparent recovery in both output and consumption, the stainless-steel market remains under severe stress. Industry reports reveal that producers are operating with loss ratios exceeding 6%, even as raw material prices such as nickel pig iron (NPI) and ferrochrome begin to soften (Discovery Alert, 2025[38]). Weak demand in key end-use sectors like construction and automotive continues to place downward pressure on prices, while persistently high output — particularly in China and emerging markets — has led to oversupply and inventory accumulation.

Africa

In 2025, South Africa's ferrochrome industry has seen a dramatic contraction—from seven major producers a decade ago to just two remaining today, Samancor and Glencore-Merafe, with around 4 million tonnes of combined installed capacity. Both announced plans to cut production amid mounting pressures, with Glencore-Merafe potentially reducing output by two-thirds. This decline is driven by persistently low global ferrochrome prices, a 700% rise in electricity costs over the past decade, and intensifying competition from low-cost producers, especially in China and Indonesia (Unichrome, 2025[39]). By 2019, approximately 34 out of 59 chrome furnaces had been taken offline, contributing to a notable rise in chrome ore exports. The decommissioning and idling of both individual furnaces and entire smelting operations significantly reduced the country's position in the global ferrochrome market, with its share falling from 39% in 2009 to 26% in 2019 (Mineral and Petroleum Resources Department, 2025[40]).

Ferrochrome production in Zimbabwe is expected to increase from 2.5 million metric tonnes in 2024 to 2.7 million metric tonnes in 2025. This growth is supported by the revival of ZimAlloys' Gweru plant under Kuvimba Mining House (Mining Zimbabwe, 2025[41]) and the launch of the Palm River Energy Metallurgical Special Economic Zone in Beitbridge — one of several major Chinese investments in the chromium industry over the past two decades (See Box 3). In addition, government policies that require companies to establish domestic smelting facilities in order to retain or obtain chrome mining rights continue to encourage local value addition (see Table 7).

Europe

In the European Union, stainless steel demand softened in the second half of 2024 due to broader macroeconomic headwinds, following a relatively strong start to the year. This slowdown affected ferrochrome consumption, with European buyers increasingly turning to cheaper Kazakh material to reduce costs (Argus Media, 2024[42]). Despite these market pressures, EU crude stainless steel output remained broadly stable, rising slightly from 5.72 Mt in 2023 to 5.77 Mt in 2024, a modest 0.8% increase (Eurofer, 2025[43]). Growth continued into 2025, with Q1 2025 output reaching 1.61 Mt, a 2.9% y-o-y increase, indicating a tentative recovery in production volumes (Worldstainless, 2025[44])

The European Union is largely dependent on ferrochrome imports, primarily from South Africa (26%), India (16%), Zimbabwe (5%), and Kazakhstan (4%). However, the Kemi mine in Finland—the European Union's only active chromium ore source—provides critical supply to Outokumpu's fully integrated ferrochrome and stainless-steel facility in Tornio, Finland which meets approximately 23% of EU demand. This domestic production significantly reduces the region's exposure to external risks, and as a result, chromium is not listed as a critical raw material by the European Commission (Project Blue, 2025[45]).

In 2024, Türkiye's chromium ore production stood at about 8 Mt (USGS, 2025[28]), with Türkiye's chromium ore exports amounting to about 1.3 Mt. China was the leading destination of Turkish chrome ore exports, valued at USD 305 million, followed by Sweden and Indonesia. (Turkish Mineral Exporters Association, 2024[46]).

Asia

China's chromium market remained stable in the first half of 2025, with domestic high-carbon ferrochrome prices averaging 0.98 USD/lb contained Cr (7,800 – 7,900 yuan/Mt, 50% Cr basis). This equilibrium reflects a balancing act between rising domestic output and reduced import volumes, which has offset potential surplus pressures. Although stainless steel demand remains seasonally subdued, smelters have maintained steady production due to stable chrome ore prices and other costs (Discovery Alert, 2025[47]). In 2024, nearly 79% of China's USD 6 billion chromium ore imports came from South Africa, followed by Zimbabwe (7.0%), Türkiye (6.2%), Albania (2%), and Pakistan (1.9%) (The Observatory of Economic Complexity, 2025[48]).

Box 3. China's strategic chromium investments in Africa

Over the past two decades, China has steadily expanded its presence in chromium-producing countries through joint ventures, strategic acquisitions, and long-term offtake agreements, particularly in Africa. Many of these projects are connected to the Belt and Road Initiative (BRI), China's flagship global strategy launched in 2013 to expand trade and investment networks across Asia, Africa, and Europe. Beyond infrastructure development, the BRI serves as a strategic vehicle to internationalise Chinese industry, secure long-term access to critical raw materials, and strengthen China's influence in global value chains.

In Africa, investments in chromium mining and ferroalloy processing have often receive support through policy coordination and diplomatic facilitation under the BRI framework. Although only one known investor[3] has officially received financial government support explicitly tied to the BRI, the channels through which firms receive support, and the criteria for being classified as BRI projects, remain opaque (Xing County Government, 2025[49]).

Many of the Chinese firms that have invested in Africa's chromium industry are state-owned enterprises (SOEs). OECD research shows that SOEs often prioritise upstream investments—such as mining and ferroalloy processing—over downstream or acquisition-based strategies, with the aim of securing long-term access to raw materials critical for domestic industries like stainless steel (Burrai, Giua and Perepechay, 2020[50]). These investments are not always driven by commercial considerations alone but may be influenced by national strategic considerations, such as geopolitical alignment or foreign policy goals, as seen in China's BRI. While evidence of direct market distortion remains limited in the chromium sector, the privileged access of SOEs to state-backed financing, diplomatic facilitation, or concessional terms could undermine the principle of competitive neutrality.

Table 5. Chinese investments in the chromium sector

Project	Ownership of Chinese firms involved	Date of investment	Part of the Belt & Road initiative	Support	Source
Sinosteel's Zimasco Investment (Zimbabwe)	SOE	2007	Yes	NA	(Mutian Supply Chain, 2021[51])
Afrochine Smelting (Zimbabwe)	POE	2012	Yes	NA	(China International Contractors Association, 2018[52])
Manhize Integrated Steel Plant (DISCO) (Zimbabwe)	POE	2021	Yes	NA	(Belt and Road Initiative, 2024[53])

Beitbridge ferrochrome project (Zimbabwe)	POE	2025	Yes	Yes	(Xing County Government, 2025[49])
ASA Metals Joint Venture (South Africa)	SOE	1996	No	No	(Sina, 2010[54])
Sinosteel–Samancor chrome ore & ferrochrome JV (South Africa)	Mixed ownership: SOE, 50% stake	2006	Yes	NA	(MOFCOM, 2020[55])
Buffelsfontein Mine (South Africa)	SOE	2005	No	No	(News 24, 2005[56])
Musina-Makhado Special Economic Zone (South Africa)	Mixed with SOEs majority	2015	No	No	(MMSEZ, 2025[57])

Note: This list identifies only those overseas Chinese investments that have been formally acknowledged as part of the BRI by Chinese government sources (central authorities, policy banks, or state media). Many other investments by Chinese firms, particularly in sectors such as infrastructure, mining, and energy, may be aligned with the BRI's goals—especially in countries that have signed BRI cooperation agreements—but are not officially branded as BRI projects. These could be considered de facto contributions to BRI objectives or part of a broader "market-driven BRI" dynamic, but such projects have been excluded from this table.
Source: OECD secretariat desk research.

Zimbabwe

With nearly 19% of the world's chromite reserves[4] (1 billion tonnes), concentrated along the Great Dyke, Zimbabwe has attracted significant investment from major Chinese industrial groups aiming to secure long-term ferrochrome supply for stainless steel production (Mysteel, 2023[58]). Chinese investments in Zimbabwe's chromium sector began in the 2000s, driven by the need to secure stable supplies of chromite for China's fast-growing stainless steel industry.

Chinese investment in Zimbabwe's chromium sector began with Sinosteel, which in 2007 acquired the local chrome ore producer Zimasco (SASAC, 2007[59]). In 2012, Tsingshan Holding Group entered through Afrochine Smelting, expanding ferrochrome output and later moving downstream via DISCO, which launched stainless steel production in 2024 and rebar in 2025 (Mysteel, 2023[58]) (Metal Miner, 2024[60]) (Steel Radar, 2025[61]).

While it is unclear whether Sinosteel and Tsingshan benefitted from direct policy support for their Zimbabwean ventures, more recent projects explicitly rely on it. As part of the BRI, Xintai Resources (Xinganglian Group) announced a USD 3.6 billion ferrochrome project in Beitbridge, backed by a RMB 550 million (USD 76 million) credit line from the Export-Import Bank of China. This facility forms part of over RMB 57 billion (USD 7.9 billion) in BRI-related loans extended since 2017 to Shanxi firms investing abroad, underscoring the strategic role of government financing in supporting overseas expansion (Xinhua, 2025[62]) (Xing County Government, 2025[49]) (China Daily, 2017[63]).

South Africa

Chinese investments in South Africa's chromium industry began in 1996, when Sinosteel partnered with Limpopo's provincial development agency to form ASA Metals, combining mining and smelting capacity (The Southern African Legal Information Institute, 2017[64]).

In 2006, Sinosteel and Samancor also set up a 50/50 joint venture to produce chromite ore and ferrochrome (China daily, 2006[65]). The venture leveraged Samancor's existing infrastructure and was financially supported by the China Development Bank (Reuters, 2007[66]). Around the same time, Jiuquan Iron & Steel (JISCO) acquired a minority stake in International Ferro Metals, securing an offtake deal for half of its ferrochrome output, though the venture later collapsed and its assets were absorbed by Samancor (News 24, 2005[56]) (Mining Review Africa, 2016[67]).

The most ambitious project was announced in 2018: a USD 10 billion metallurgical complex in the Musina-Makhado Special Economic Zone (MMSEZ), South Africa's first SEZ to be operated by a foreign entity (Reuters, 2018[68]). The zone is managed for a 90-year term by the local subsidiary of Chinese firm Shenzhen Hoi Mor Resources (Mining Weekly, 2017[69]). The project was financed by a consortium of Chinese investors, including Shenzhen Hoi Mor, Power Construction Corporation of China (PowerChina), and the Bank of China. It includes a 3 Mt/year stainless steel plant, a 3 Mt/year ferrochrome facility, and a 500,000 t/year silicomanganese plant, marking a shift toward large-scale, vertically integrated steel production (Reuters, 2018[68]). However, recent developments suggest that implementation has stalled, most likely due to weak market conditions and environmental concerns (The Paper, 2021[70]). Firms operating within the MMSEZ benefit from significant incentives, such as a reduced corporate income tax rate of 15% (compared to the standard 28%) and a 10% accelerated depreciation allowance on new and unused buildings or improvements located in the zone (South African Revenue Service, 2018[71]).

In 2024, Kazakhstan produced about 6.5 million metric tonnes of chromite ore. Although not the largest producer, the country holds the world's second-largest chromite reserves after Zimbabwe, with an estimated 320 million tonnes of shipping-grade material (USGS, 2025[28]).

India's ferrochrome production declined by 6% in the second half of 2025 (October 2024–March 2025) reaching 0.65 million tonnes, down from 0.69 million tonnes in H1 2025. This decline was driven by falling ferrochrome prices, rising domestic chrome ore costs due to constrained supply and deteriorating ore grades, and weak demand from stainless steel producers—both domestic and international (BigMint, 2025[72]) (Argus Media, 2024[42]). India's chromium demand reached a value of USD 566 million in 2024 and is projected to grow at a compound annual growth rate (CAGR) of 5.6% by 2034. This growth is driven by rising demand from stainless steel production, particularly for infrastructure, automotive, and renewable energy applications requiring corrosion-resistant materials (Expert Market Research, 2025[73]).

North America

In the United States, stainless steel melt-shop production showed a strong recovery. After declining to 441 thousand tonnes in Q4 2024, output rebounded to 553 thousand tonnes in Q1 2025, marking a 25.4% quarter-on-quarter increase. Compared to the same period in the previous year, production also rose by 8.6% from 509 thousand tonnes in Q1 2024. This rebound reflects improved downstream demand and restocking following earlier inventory corrections (Worldstainless, 2025[44]) (Argus Media, 2024[74]).

The United States has no chromite ore production and no ferrochrome smelters domestically and the country remains highly import-reliant (approx. 77%) for chromium-derived inputs, with most coming from South Africa, and smaller volumes from Kazakhstan, Türkiye, and India (USGS, 2025[28]).

Policy actions

Global policy assessment

Recent trade and policy developments in chromium raise strategic concerns for stainless-steel supply chains. According to OECD data (OECD, 2025[12]), chromium ore exports from both South Africa and Zimbabwe are affected by some form of export restrictions – these two countries together represent about 88% of global exports of chromium ores (Table 6). These measures have been introduced with the stated objective of promoting domestic beneficiation, by scaling up the value chain and processing chrome ore locally rather than exporting it in raw form.

Beyond the restrictions themselves, the deeper vulnerability lies in the high geographic concentration of production of this material in southern Africa, coupled with extensive Chinese investment and the dominance of China-linked trading relationships with both South Africa and Zimbabwe. This may lead to a situation where market-distorting subsidisation observed in chromium market is then translated into effects for the steel stainless market, in the form of supply shortages of chrome ores and price pressures on ferrochrome production.

Table 6. Active export restrictions applied to chromium and ferrochrome

Chromium ores				Ferrochromium			
Economy	Scrap exports (Mt)	Share of world exports (%)	Number of export restrictions	Economy	Scrap exports (Mt)	Share of world exports (%)	Number of export restrictions
ZAF	19.6	82.2	1	ZAF	3.3	49.6	0
ZWE	1.4	5.9	2	KAZ	1.8	27.7	0
TUR	1.2	5.2	0	IND	0.6	8.6	0
PAK	0.4	1.7	0	ZWE	0.4	6.2	0
ALB	0.4	1.6	0	RUS	0.1	2.0	0
OMN	0.2	1.0	0	EU	0.1	1.2	0
PNG	0.2	0.7	0	CHN	0.1	1.0	0
MDG	0.1	0.5	0	ALB	0.1	0.9	0
PHL	0.1	0.5	0	TUR	0.1	0.8	0
MOZ	0.0	0.2	0	OMN	0.0	0.7	0
IRN	0.0	0.1	0	BRA	0.0	0.5	0
CHN	0.0	0.1	0	MOZ	0.0	0.3	0
EU	0.0	0.1	0	IRN	0.0	0.2	0
BRA	0.0	0.0	0	JPN	0.0	0.1	0
RUS	0.0	0.0	1	GEO	0.0	0.1	0
SDN	0.0	0.0	0	KOR	0.0	0.0	0
AFG	0.0	0.0	0	TWN	0.0	0.0	0
USA	0.0	0.0	0	USA	0.0	0.0	0
IND	0.0	0.0	2	GBR	0.0	0.0	0
KEN	0.0	0.0	0	CHE	0.0	0.0	0

Note: Data on chromium trade are obtained from ISSB and include the following HS codes (6 digit): 261000 (Chromium ores), 720241, 720249 (Ferrochrome). Data on export restrictions are obtained from the OECD Export restrictions on critical raw materials database and complemented by desk research carried out by the Steel Secretariat. EU data do not include EU intra trade.

Recent policy actions related to chromium

In June 2025, the South African Cabinet approved a comprehensive policy package aimed at reviving the country's declining ferrochrome industry. Recognising the sector's importance for industrialisation and value addition, the government endorsed a three-pronged approach: introducing export controls on chrome ore through a permit system managed by the International Trade Administration Commission (ITAC); developing an export tax on chrome ore; and expanding incentives for ferrochrome smelters within Special Economic Zones. These measures seek to enhance domestic beneficiation, improve industrial competitiveness, and ensure more value is retained within the country from its chrome resources (South African Government, 2025[75]).

In June 2025, Zimbabwe introduced a policy requiring all new chrome mining titles over 100 hectares to be linked to the development or expansion of local ferrochrome smelting capacity. This measure, alongside the continued restrictions on raw chrome ore exports implemented in 2021 and 2023, aims to promote domestic value addition and strengthen Zimbabwe's position in the ferrochrome supply chain. The government also reaffirmed its "use-it-or-lose-it" principle, warning that unused mining rights—particularly in the chrome sector—may be revoked if not aligned with beneficiation objectives. These steps reflect Zimbabwe's broader strategy to industrialise by processing more of its mineral resources locally, reduce reliance on raw exports, and drive economic growth (Herald online, 2025[76]).

In June 2025, in Australia, the Queensland's 2025 Critical Minerals Strategy identified chromium as one of the key "new economy" minerals, alongside cobalt, titanium, vanadium and rare earths, due to its utility in renewable energy technologies such as wind turbines and steel alloys (Queensland Government, 2025[77]). The State has committed AUD 315 million to drive exploration, processing, and downstream manufacturing—including dedicated research on secondary prospectivity to recover chromium from mine waste and tailings (SFA Oxford, 2025[78]). These initiatives reflect Queensland's plan to build domestic value chains for critical minerals and strengthen the state's role in the clean energy transition.

To safeguard its strategic mineral resources and promote value addition domestically, in June 2023 the Indian government placed the export of chromium ores and concentrates under the "restricted" category, meaning that exporters must now obtain a license from the Directorate General of Foreign Trade (DGFT) (Government of India, 2023[79]). This policy shift reflects the government's broader objective to curb the unregulated outflow of critical raw materials that are essential for high-value industries such as stainless steel, defence, and energy technologies. By restricting exports, India aims to ensure greater availability of chromium for domestic processors, encourage downstream investments, and support the development of an integrated supply chain aligned with the country's self-reliance and industrial growth ambitions.

Table 7. Major Chromium-related policy developments in key jurisdictions

Jurisdiction	Policy	Effect	Announcement date	Source
South Africa	Cabinet approved chrome ore export controls (ITAC permit requirement), export-tax proposal, preferential electricity tariffs via NPAs, and expanded SEZ incentives for ferrochrome smelters	Aims to curb raw chrome exports, support domestic ferrochrome production, lower energy costs for smelters, and promote beneficiation	26-06-2025	(South African Government, 2025[75])
Zimbabwe	Raw material export restriction	Prohibits export of unprocessed (unbeneficiated) base mineral ores, including nickel, chrome, copper, and others, unless authorised by a permit from the Minister of Mines;	06-01-2023	(Zimbabwe Government, 2023[80])
Zimbabwe	New chrome mining titles exceeding 100 hectares will only be issued if linked to the expansion or development of smelting capacity (ferrochrome furnaces)	Aims to increase local value addition and support ferrochrome production for stainless steel; enforces beneficiation before granting large-scale mining rights	11-06-2025	(Herald online, 2025[76])
Australia	Chromium was included in	Supports investment in	26-06-2023	(Queensland Government,

	Queensland's Critical Minerals Strategy, which committed $315 million to accelerate exploration, mining, processing, and manufacturing within the state. This funding supports initiatives such as the Critical Minerals Investor Hub, designed to attract global investment and promote downstream value chains.	chromium exploration, processing and its application in wind technology; aims to boost domestic supply chain resilience and clean tech development		2025[81])
India	Export of chromium ores and concentrates (HS Code 2610) placed under restricted category, requiring DGFT licence.	Exporters must obtain authorisation, reducing raw ore exports to preserve domestic supply for ferrochrome and steel industries.	22-06-2023	(Government of India, 2023[79])

Source: OECD steel secretariat desk research

4 Nickel

Nickel is a non-ferrous base metal with a broad range of industrial applications. Most of its consumption is directed to stainless steel[5] (65%), nickel-based alloys (7%), plating (5%), stainless steel foundries (2%), alloy steels (3%), batteries (16%), and other uses (2%) (Nickel Institute, 2023[82]). Overall, more than 70% of nickel demand is tied to steel-related applications. At the same time, batteries already represent a smaller but rising share of use, even though stainless steel is expected to continue dominating overall consumption.

The nickel value chain is highly complex, with different grades of ore concentrated among a limited number of producers, and multiple processing steps required before nickel reaches its end uses (See Box 4). In recent years, a slowdown in the stainless-steel market (see Box 2), combined with weaker-than-expected demand from the battery sector, has led to oversupply and falling prices. Many nickel producers, particularly in OECD countries, have struggled to operate with shrinking margins and some have been forced to exit the market. Between 2020 and 2024, Indonesia added an estimated 1.5 million tonnes of new nickel supply, while production outside Indonesia contracted by around 500,000 tonnes. As a result, Indonesia's share of global refined nickel output rose from 6% in 2015 to 61% in 2024 and is projected to reach about 74% by 2028 raising concerns among consuming economies about growing supply dependencies and the associated risks for market stability (Financial Times, 2025[83])

Box 4. The nickel value chain

Nickel demand is dominated by stainless steel, which relies primarily on Class 2 nickel products. These lower-purity but cost-effective forms are well suited for stainless steel applications. Class 1 nickel, by contrast, is higher purity and mainly used in batteries.

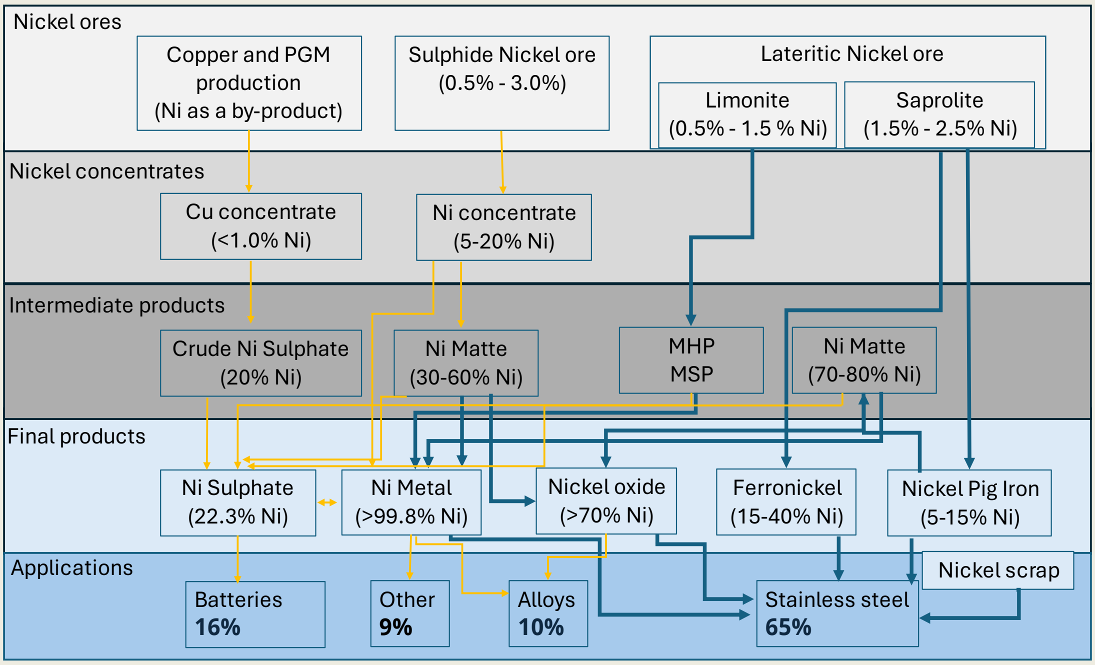
Class 2 nickel is mostly produced from laterite ores[6], while Class 1 nickel comes mostly from sulphide deposits, concentrated in Russia, Canada, and Australia. Smaller volumes of Class 1 nickel also come as a by-product of copper and platinum group metals (PGMs) mining, particularly in Russia and South Africa, providing a valuable but limited source of high-purity material.

In 2023, laterites supplied about 82% of global mined nickel (Project Blue, 2024[84]). These deposits are found mainly in tropical regions, with major concentrations in Indonesia, the Philippines, Australia, Cuba, New Caledonia (France), and Brazil. Among them, Indonesia has emerged as the leading supplier of NPI and ferronickel—the main feedstocks for stainless steel.

In recent years, technological advances have enabled laterite ores, traditionally processed into NPI and ferronickel for stainless steel, to be redirected toward battery materials. Through high-pressure acid leaching (HPAL), laterites are converted into mixed hydroxide precipitate (MHP) or mixed sulphide precipitate (MSP), both of which can be refined into nickel sulphate for use in high-nickel battery chemistries[7] (Azo Mining, 2025[85]).

These developments have been spearheaded in Indonesia, where large-scale HPAL plants—backed by Chinese investment—have driven costs down and accelerated ramp-up times. As a result, production of battery-grade intermediates from laterites has grown rapidly: MHP output exceeded 250,000 tonnes in 2023 and is projected to more than double by 2027 (Azo Mining, 2025[85]). While this creates a new outlet for laterite nickel, it also raises concerns. The HPAL route is highly capital-intensive, waste-intensive, and carbon-heavy, generating more than a tonne of tailings[8] per tonne of nickel, posing environmental and management challenges in tropical regions where many projects are located. Moreover, because intermediates that once supplied stainless steel are now being converted into matte and sulphate, stainless producers face the prospect of increased competition for laterite feedstock in the medium term—even if, for now, oversupply has kept prices low.

Figure 4. Schematic of the nickel value chain



Notes: Blue lines indicate pathways leading to stainless steel production, while yellow lines indicate pathways used in batteries. Certain process steps have been simplified for clarity and to highlight the main value chain flows.
Source: OECD Steel Secretariat desk research.

Recent market developments

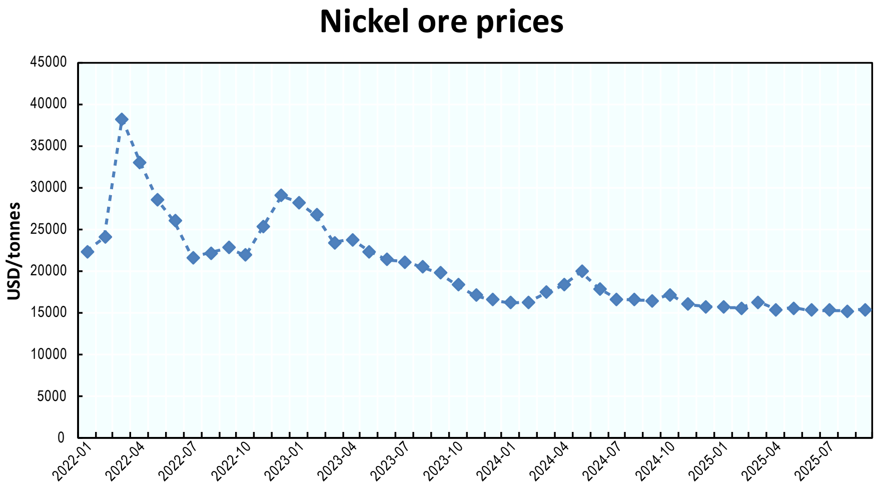
Global nickel mine production fell to around 3.7 million tonnes in 2024, as low prices and rising Indonesian output prompted production cuts in several key countries. Australia and the Philippines reduced output by 26% and 20% respectively, while New Caledonia saw a 52% decline, affected by both weak market conditions and civil unrest (USGS, 2025[28]). In contrast, Indonesia—the world's largest nickel producer with a 63% global market share—continued expanding production capacity, contributing to a persistent oversupply that is expected to last until at least through 2027-2028 (Reuters, 2025[86]).

Nickel prices peaked at over USD 48,000 per tonne in 2022 before entering a prolonged decline. By the end of 2023, the London Metal Exchange (LME) cash price was averaging around USD 16,400 per tonne, reflecting a 21% drop compared to 2022, mainly driven by persistent oversupply from Indonesia (Trading Economics, 2025[87]).

In 2024, the market remained volatile. Prices briefly climbed to about USD 19,000 per tonne in May on the back of mine closures, delays in Indonesian quota approvals, political unrest in New Caledonia, and restrictions on Russian supply, but fell back to around USD 16,000 by November (USGS, 2025[28]). For the year as a whole, nickel averaged roughly USD 16,400 per tonne.

This downward trajectory extended into 2025, with prices falling further to around USD 15,000 by mid-year. At this level, nearly a quarter of global producers were estimated to be operating at a loss (Reuters, 2025[86]). At the same time, the market outlook was further undermined by slower-than-expected demand growth, particularly in the battery sector where a shift toward lithium iron phosphate (LFP) chemistries has led to downward revisions in long-term nickel demand (McKinsey, 2025[88]). Meanwhile, new supply continues to come online, including a nickel sulphide operation in Kalumbila, Zambia, which began commercial production in June 2025.

Figure 5. Nickel ore average historical prices (2022-2025)



Source: Kallanish.

Asia

In June 2025, China's refined nickel and NPI sectors faced mounting production and cost pressures due to raw material shortages, weak margins, and sluggish stainless-steel demand. Refined nickel output dropped 10% month-on-month, mainly due to significant cuts by top-tier producers unable to secure feedstock. Despite a 15% year-on-year increase, domestic refined nickel operating rates remained low at 59%, and spot prices continued to fall. NPI output declined by over 5% month-on-month, with smelters squeezed between rising ore costs and record-low product prices. Rising costs for high-grade Philippine ore, combined with weak demand for 200-series stainless steel, further reduced the profitability of low-grade NPI, prompting smelters to cut back production (Discovery Alert, 2025[89])

In 2024, Indonesia remained the world's largest nickel producer, accounting for 59% of global output with 2.2 million metric tonnes (USGS, 2025[28]). Indonesian NPI output fell 3.26% month-on-month in June due to heavy rainfall disrupting logistics in Halmahera and continued resistance from downstream consumers. Although year-on-year output increased in June, persistently high costs and ongoing losses are likely to keep NPI plants under pressure, prompting some to consider temporary shutdowns or shifts towards nickel matte production for the battery sector (Discovery Alert, 2025[89]).

The Philippines, despite ranking only sixth globally in nickel reserves, has been the world's largest exporter of nickel ore since 2015, following Indonesia's export ban on unprocessed ores. In 2025, Manila briefly considered a similar ban to promote domestic processing, but the plan was withdrawn after opposition from industry. Nickel ore exports remain central to the Philippine economy, representing over 70% of dry bulk shipments, with more than 87% destined for China, where the ore is primarily used in stainless steel and, increasingly, in battery production (Hellenic Shipping News, 2019[90]).

Europe

EU imports of nickel ores and concentrates are primarily sourced from Finland (39%), Canada (24%), and Greece (19%), with additional volumes coming from South Africa (8%) and the United States (4%). The EU's refined nickel imports are sourced predominantly from Russia (29%), Finland (18%), and Norway (11%). Smaller but still significant shares come from Canada and Australia (each at 7%) and Greece (4%), with additional contributions from other countries (European Commission, 2023[91]). At the same time, European nickel producers face rising costs and regulatory uncertainty, despite being among the most energy-efficient globally. The Nickel Institute has warned that inconsistent policies and postponed investments risk are undermining competitiveness, reinforcing the EU's dependence on external supply at a time when nickel is critical for the green, digital, and defence transitions. (Euractiv, 2025[92])

North America

The United States currently has only one operating nickel mine, the Eagle Mine in Michigan, which produced about 8,000 tonnes of nickel concentrate in 2024—a 50% drop from the previous year—with all output exported to smelters in Canada and other international markets (USGS, 2025[28]). To strengthen domestic critical mineral capabilities, the U.S. Department of Defense, through the Defense Production Act (DPA) Investments Program, awarded over USD 400 million in 2024 to support U.S.-based projects, including a USD 7 million grant under DPA Title III to a Missouri firm establishing a hydrometallurgical pilot plant for cobalt and nickel extraction (USGS, 2025[28]). These measures aimed to reduce U.S. dependence on foreign supply chains and support industrial and defence applications across a range of strategic sectors. However, some policy developments may introduce new challenges. In July 2025, the U.S. Congress passed the One Big Beautiful Bill Act (OBBBA), which modifies several clean energy tax incentives established under the Inflation Reduction Act. While the Section 45X tax credit for domestic production of critical minerals—including nickel—remains in place, it is now subject to a gradual phase-out, with benefits declining from 2031 and fully expiring by 2033. The 45X credit provides a 10% tax incentive to support the extraction and processing of critical minerals, improving project economics and encouraging investment in domestic supply chains (U.S Congress, 2025[93]). At the same time, progress is being made in recycling, with a new Ohio facility commencing operations in 2024 to produce nickel-cobalt intermediates from scrap (U.S. Department of the Interior, 2025[94]).

In 2024, Canada produced 190,000 tonnes of nickel concentrate, a 19.5% increase compared to 2023 (USGS, 2025[95]). The increase reflected a combination of factors, including the ramp-up of capacity at existing operations, reduced operational disruptions compared to 2023, and stronger investment signals from the battery and clean energy sectors. Federal support also played a role: Canada's Critical Minerals Strategy prioritised nickel as a strategic material, while Canada Nickel announced it had secured a Letter of Interest from Export Development Canada for up to USD 500 million in financing for the Crawford project in Ontario, one of the world's largest undeveloped nickel sulphide deposits (Crux Investor, 2025[96]).

Oceania

Australia's nickel concentrate production fell from 149,000 tonnes in 2023 to 110,000 tonnes in 2024, a decline of around 26% (USGS, 2025[28]). In early 2024, three Western Australian mines closed and other sites were placed under care and maintenance, while BHP largely suspended operations at its Nickel West division and is now considering a full divestment (S&P Global, 2025[97]). The high cost base of Australian operations—driven by energy, labour, and regulatory expenses—has left producers vulnerable. Industry representatives warn that up to 10,000 jobs could be at risk, underscoring the broader economic impact of the downturn (News.com.au, 2025[98]). Reflecting these challenges, government forecasts show nickel export values falling from AUD 2.2 billion in 2024-25 to AUD 1.2 billion in 2025–26 and AUD 1.1 billion in 2026–27 (Ministry of Industry of Australia, 2024[99]).

Policy actions

Global policy assessment

Nickel supply is highly concentrated in a few regions, making global stainless-steel and battery industries vulnerable to policy shifts in resource-rich countries. The most prominent case is Indonesia, which since 2020 has enforced a full ban on nickel ore exports to promote domestic smelting and battery-related investments (See Box 5)

Other producers have also sought to limit the outflow of unprocessed ore: the Philippines, while not imposing an outright ban, has introduced fiscal and administrative measures such as VAT rules and strict export permitting requirements that raise the cost of shipping raw ore abroad. Currently, four of the world's major nickel ore suppliers—Indonesia, the Philippines, New Caledonia and Russia—maintain some form of restriction on nickel ore exports. By contrast, ferronickel and nickel oxide sinter, two key processed intermediates used in stainless-steel production, remain unaffected.

The core concern is therefore the tightening control over the raw ore segment, which is critical for feeding stainless-steel production. By limiting the tradability of nickel ore, these measures heighten the vulnerability of global supply chains to policy shifts in a handful of jurisdictions, creating the potential for price volatility, shortages, and strategic dependencies.

Table 8. Active export restrictions on nickel ores and products

Nickel ores			Ferronickel			Nickel Oxide Sinter		
Economy	Export share (% by volume)	# Exp. Restr.	Economy	Export share (% by volume)	# Exp. Restr.	Economy	Export share (% by volume)	# Exp. Restr.
PHL	61.3	2	IDN	91.7	0	IDN	57.4	0
NCL	26	1	NCL	2.2	0	NCL	12.3	0
CIV	6.6	0	BRA	1.4	0	PNG	11.6	0
GTM	2.9	0	COL	1.2	0	PHL	6.2	0
IDN	1.1	2	KOR	1.1	0	AUS	6.1	0
RUS	0.8	2	DOM	0.7	0	TUR	3.3	0
AUS	0.5	0	JPN	0.3	0	EU	1.6	0

Note: Data on Nickel trade are obtained from COMTRADE and include the following HS codes (6 digit): 260400 (Nickel ores), 720260 (Ferronickel), 750120 (Nickel Oxide Sinter). Data on export restrictions are obtained from the OECD Export restrictions on critical raw materials database and complemented by desk research carried out by the Steel Secretariat. EU data do not include EU intra trade.

Box 5. Indonesian policy on nickel

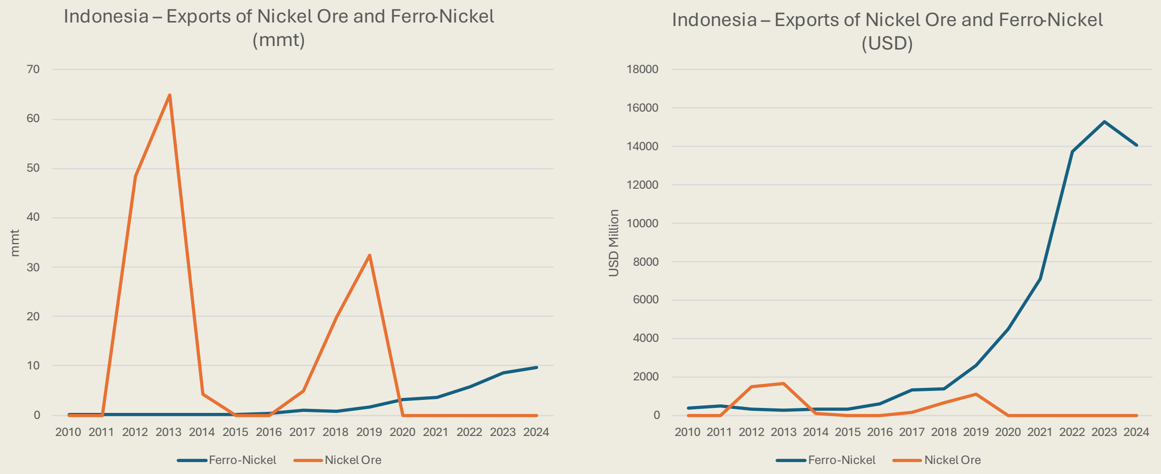
In recent years, Indonesia has sought to leverage its vast nickel reserves, the world's largest (55Mt (USGS, 2025[100])), to promote industrial development, particularly in its stainless steel and battery sectors. Through the implementation of restrictive trade policies, including export restrictions, the country has aimed to use its resources as a pathway to achieve its development strategy. While Indonesian producers increased their supply share by 219%, capturing 54% of the global market in 2023, this policy shift has dramatically altered global supply dynamics: between 2017 and 2023, Canada's sulphide nickel supply share shrank by 72%, China's by 34%, and Australia's by 43% for sulphides and 44% for laterites (Project Blue, 2024[84]).

The Indonesia government started to introduce restrictive measures on the nickel sector in the mid-1990s to foster downstream development in the stainless-steel industry (OECD, 2024[101]). However, additional restrictions were subsequently adopted in response to the sharp acceleration of nickel ore extraction after 2006, driven by increased Chinese demand, where exports rose from a stable 10Mt annually before 2007 to 71Mt by 2013, 90% of which went to the Chinese stainless-steel sector. This surge in nickel extraction reflected China's rapid industrial expansion, particularly the growth of its NPI sector. The scale of exports led to environmental degradation, with low economic returns, as unprocessed ore lacked value-added processing (UNCTAD, 2017[102]).

In 2009, the Indonesian government enacted the Mining Law (Law No. 4/2009), which placed mineral resources under strict state control and designated nickel as a strategic commodity (Article 27, Elucidation). The law empowered the state to set production quotas by province, impose export restrictions, and tighten licensing rules (Article 5). To curb value leakage, it required mining companies to process and smelt ore domestically, banning unprocessed exports after a five-year transition (Articles 102–103). Full compliance was enforced in January 2014, marking a decisive shift in Indonesia's nickel industry. During this period, Chinese firms started to invest in the Indonesian nickel mining sector and establish joint ventures with Indonesian firms under the BRI. Indonesia welcomed Chinese investments because its infrastructural deficit, the largest in Southeast Asia, was notoriously hindering its growth potential (Carnagie Endowment, 2023[103]). In 2023, Indonesia emerged as the largest destination for Chinese Belt and Road Initiative investment, attracting around USD 7.3 billion. Chinese firms were also responsible for building more than 90 percent of the country's nickel smelters (CSIS, 2024[104]).

Despite the surge in nickel ore extraction between 2007 and 2013, Indonesia's smelting capacity remained stagnant. The 2014 export ban therefore aimed to achieve two key objectives: first, to reduce extraction rates and mitigate environmental degradation; and second, to stimulate the growth of domestic smelting industries and enhance value addition. Following the ban, Indonesia's nickel smelting industry saw an expansion in capacity (UNCTAD, 2017[102]). Foreign direct investment has played a central role in the expansion of Indonesia's downstream nickel sector. Before 2014, the country had just two active smelters. By 2020, this number had grown to 13, and by mid-2023 it had surged to 43, with a further 28 projects under construction and 24 more in the planning stage (CSIS, 2024[104]).

Figure 6 Indonesian exports of nickel ore and ferro-nickel



Source; ISSB

Prior to the ban, Chinese NPI plants were the main buyers of Indonesian nickel ore, supplying China's steel industry. Following the ban, Chinese firms became the largest investors in Indonesia's nickel processing sector. While the export restrictions succeeded in expanding domestic capacity, they also paradoxically deepened Indonesia's integration into a supply chain largely serving China's stainless-steel sector.

This wave of financing from Chinese state-owned banks and private enterprises helped Indonesia transition from a raw material supplier into a key player in the nickel value chain (see Figure 6) but it also contributed to significant changes in cost structures, raising concerns about potential distortions (Carnagie Endowment, 2023[103]). A clear example is the Morowali Industrial Park (IMIP) in Central Sulawesi, developed by Tsingshan Group and its Chinese partners. Established after Indonesia's 2014 nickel ore export ban, IMIP rapidly became one of the largest buyers of domestic nickel, operating within an oligopsonistic market where a few industrial parks could dictate purchase prices. This leverage allowed them to secure nickel well below market value, squeezing domestic miners and prompting cost-cutting measures that undermined environmental protection and worker safety (Carnagie Endowment, 2023[103]).

This pricing power also enabled Indonesia to sustain production even when global prices fell below levels that forced competitors to shut down. Indonesian officials have indicated they are comfortable with nickel at around USD 18,000 per tonne — a price that secures margins for local producers but remains too low for mines in Australia, Canada, or New Caledonia, which typically require prices above USD 22,000 to operate profitably (Mining.com, 2025[105])

This advantage is reinforced by the economies of scale and vertical integration of Indonesia's industrial parks, supported by Chinese investment and technology transfer, which enable smelters to be commissioned comparatively quickly — often reaching full capacity within a year, compared with three to five years for similar projects elsewhere. This structural cost advantage has contributed to a significant shift in global market shares. Between 2020 and 2024, Indonesia added an estimated 1.5 million tonnes of new nickel supply, while production outside Indonesia contracted by around 500,000 tonnes. As a result, Indonesia's share of global refined nickel output increased from 6% in 2015 to 61% in 2024, and is projected to reach approximately 74% by 2028 (Financial Times, 2025[83]).

The 2014 ban applied uniformly across all firms and initially did not trigger formal disputes at the World Trade Organization (WTO). However, in 2019, the European Union challenged the measure, arguing that it violated global trade rules. In 2022, the WTO ruled against Indonesia, finding that the restrictions breached its obligations under international trade law (WTO, 2022[106]).

In 2017, the government relaxed the ban by temporarily allowing nickel ore exports with a concentration below 1.7% subject to specific requirements[9], initially until 2022. However, the total export ban of nickel ore was reinstated earlier than planned, in 2020, with no foreseeable date for revocation[101].

Overall, statistical analysis suggests that Indonesia's export restrictions had a significant impact on the composition of domestic production and exports, accelerating the shift from primary nickel products towards downstream activities, particularly stainless steel. While this transition coincided with a marked expansion in stainless steel exports and substantial investment in downstream capacity, the economic benefits were neither immediate nor unequivocally positive in the years following the bans. Moreover, the development of Indonesia's stainless steel industry has been driven to a large extent by foreign—primarily Chinese—investors, raising questions about the domestic capture of value added generated by these activities. As a result, while export restrictions reshaped Indonesia's position in global nickel value chains, their net contribution to broader economic welfare remains ambiguous (OECD, 2025[107]).

Recent policy actions related to nickel

Recent policy initiatives underscore nickel's rising strategic importance in producer and consumer countries alike. In Canada, the federal government committed C$344 million under its Critical Minerals Strategy (March 2023) to bolster exploration, innovation, regulatory capacity, and international partnerships across priority minerals, including nickel and chromium. Complementing this, Manitoba released its own Critical Minerals Strategy (July 2023), which seeks to attract investment and position the province as a leading supplier of nickel and other clean-energy minerals. Together, these initiatives aim to strengthen Canada's role in global supply chains while reinforcing its positioning as a secure source of responsibly produced critical minerals.

Australia has similarly elevated nickel's profile. Its inclusion on the national Critical Minerals List (February 2024) provides producers access to financing through the AUD 4 billion Critical Minerals Facility and related support programmes. Building on this, Queensland's Critical Minerals Prospectus (August 2025) identifies nickel as a priority, offering case management, fast-tracked approvals through Critical Minerals Queensland (CMQ), and targeted funding via the A$170 million Critical Minerals and Battery Technology Fund.

While countries such as Canada and Australia are pursuing supportive measures to attract investment and strengthen supply security, producer jurisdictions are introducing policies aimed at retaining greater value domestically. In New Caledonia—a French overseas territory with autonomous authority over its vast nickel reserves—an export tax on nickel, chromium and cobalt ores (January 2025) was introduced to channel

[1] MEMR Regulation No. 25/2018 and MOT Regulation No. 96/2019

revenues into a Nickel Fund and later a Future Generations Fund. Zimbabwe has gone further, prohibiting the export of unprocessed base mineral ores, including nickel and chrome (January 2023), in order to promote domestic beneficiation. These policies reflect a different approach to critical minerals governance, favouring fiscal instruments and export restrictions over investment incentives.

Table 9. Key Nickel-Related Policy Developments

Jurisdiction	Policy	Effect	Announcement date	Source
Canada	Funding allocation under the Canadian Critical Minerals Strategy	C$344 million in new federal funding to support exploration, innovation, international partnerships, and regulatory capacity for critical minerals, including nickel and chromium	7-03-2023	(Government of Canada, 2023[108])
Canada	Manitoba Critical Minerals Strategy	Sets out a provincial plan to promote development of lithium, nickel, cobalt, graphite, copper, and rare earths; aims to attract investment, support exploration, and position Manitoba as a key supplier of critical minerals for clean energy and industrial needs	25-07-2023	(Manitoba Government, 2024[109])
Australia	Nickel added to the Critical Minerals List	Grants nickel producers access to financing under the AUD 4 billion Critical Minerals Facility and critical mineral–related programmes (e.g. International Partnerships Program)	16-02-2024	(Ministry of Industry of Australia, 2024[110])
Australia	Queensland backs nickel as a critical mineral through fast-tracked approvals and targeted funding.	The Queensland Critical Minerals Prospectus (July 2025) identifies nickel as a priority sector. Support is provided through Critical Minerals Queensland (CMQ), which helps projects with case management and faster approvals, and through the A$170m Critical Minerals and Battery Technology Fund	14-08-2025	(Queensland Government, 2025[81])
New Caledonia	tax on the export of mining products (nickel, chromium, cobalt ores, raw or treated except metallurgical products)	Introduces an ad valorem tax on exported nickel, chromium and cobalt ores; revenues are temporarily channelled to the Nickel Fund, later to a Future Generations Fund	10-01-2025	(New Caledonia Congress, 2023[111])
Zimbabwe	Raw material export restriction	Prohibits export of unprocessed (unbeneficiated) base mineral ores, including nickel, chrome, copper, and others, unless authorised by a permit from the Minister of Mines.	06-01-2023	(Zimbabwe Government, 2023[80])

Source: OECD secretariat desk research

5 Comparative policy perspective

On the supply side, all three inputs show strong concentration patterns that create significant dependencies. In the case of scrap, China is by far the largest user and one of the largest generators but contributes only a negligible share of global exports, meaning international markets rely heavily on flows from Europe and North America. Chromium is even more concentrated, with production and exports dominated by just a handful of suppliers: South Africa alone accounts for 45% of chrome ore production, and more than 90% of world exports come from only three countries. Nickel shows a similar picture, with Indonesia and the Philippines together responsible for over two-thirds of global mine production, and Indonesia further consolidating its position in downstream nickel products. These patterns underline that, while the nature of the materials differs, dependencies in all three cases are shaped by the concentration of supply in a very limited number of jurisdictions.

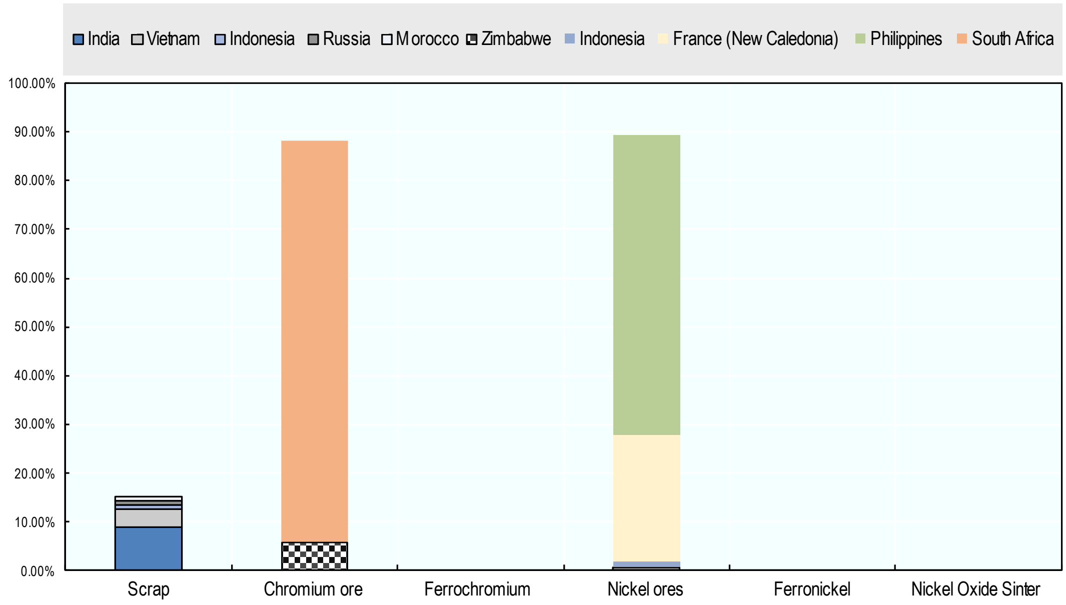
Table 10. Concentration of supply and exports of selected raw materials

Commodity	Top users or producers (% of world total)	Share (%)	Top 3 exporters (% of world exports)	Share (%)
Scrap	China ,EU, USA	75%	EU, US, Japan	57%
Chrome ore	South Africa, India	69%	South Africa, Zimbabwe, Türkiye	93%
Ferrochrome	China, South Africa, Zimbabwe	73%	South Africa, Kazakhstan, India	86%
Nickel Ore	Indonesia, Philippines	68%	Philippines, New Caledonia, Ivory Coast	93%
Nickel oxide sinter	Indonesia	-	Indonesia, New Caledonia, Papua New Guinea	81%
Ferronickel	Indonesia	-	Indonesia, New Caledonia, Brazil	95%

Note: Reliable statistics on the global production volumes of ferronickel and nickel oxide sinter are scarce. What is clear, however, is that Indonesia dominates global production of ferronickel, reflecting both its large laterite ore base and the rapid expansion of its smelting capacity in recent years.
Source: Steel Secretariat desk research

On the demand side, reliance on imports varies significantly across countries and commodities. Some economies, such as China, are almost entirely dependent on external supply of chrome ore, with more than 80% of imports sourced from South Africa alone. By contrast, in the scrap market, countries like Türkiye and India rely heavily on imports to cover domestic deficits—around 60% and 34% of their total scrap use, respectively—often concentrated in a few main suppliers such as the European Union and the United States. For nickel, import dependence is also substantial, with stainless steel producers in economies such as China, Japan and the EU sourcing much of their raw material from Indonesia and the Philippines.

Figure 7. Share of global trade in selected raw materials subject to export restrictions



Source: Data on export restrictions are obtained from the OECD Export restrictions on critical raw materials database and complemented by desk research carried out by the Steel Secretariat.

Export restrictions include measures such as export bans, taxes, quotas, or licensing requirements that limit the free flow of raw materials across borders. In ferrous scrap, restrictions have multiplied in recent years, with 42 economies applying some form of measure by 2023. Yet because most major exporters allow trade to continue, only about 17% of global flows are restricted. In China's case, the 40% export tariff in place since the mid-2000s meant the country was never a major scrap exporter, so the risk from Chinese measures is limited but would grow significantly as the Chinese scrap reservoir grows in response to past consumption of steel-intensive goods. For Russia, earlier assessments based on 2013-2021 conditions looked more concerning (exports around 4.1 Mt), but by 2024 exports had fallen to about 1.1 Mt—roughly 0.8% of world trade—so the immediate risk from Russian measures is now much lower. In the chromium market, restrictions imposed by South Africa and Zimbabwe affect nearly 90% of world exports. These measures have been introduced explicitly to promote domestic beneficiation by processing ore locally rather than exporting it in raw form, but heighten supply risks for stainless-steel producers dependent on imported ore. In the nickel market, the most prominent case is Indonesia's export ban on ore, with the Philippines and others applying additional fiscal and permitting rules. These measures similarly aim to encourage investment in local smelting and battery-related industries. By contrast, trade in downstream products of nickel and chromium, such as ferrochromium, ferronickel, and nickel oxide sinter, remains largely open, with no significant restrictions currently in place. Overall, while the form and reach of export restrictions vary, they share the effect of tightening state control over raw ore trade and increasing the vulnerability of global supply chains to policy shifts in a handful of countries.

6 Conclusions

This report has highlighted how three critical inputs for steelmaking—ferrous scrap, chromium, and nickel—face distinct but interlinked challenges in terms of availability, concentration, and policy risks.

On **availability**, ferrous scrap is widely generated but usable supply depends on uneven collection and recycling systems: mature regions such as North America, Europe and Japan collect and export large volumes, while developing economies face deficits and import dependence. Chrome and nickel ore reserves are very large, but some countries are struggling to process ores domestically economically. South Africa's mining and electricity challenges have reduced smelting capacity, limiting how much ferrochrome is available. In nickel, oversupply and falling prices have forced many producers outside Indonesia to curtail or shut operations, reducing the amount of ore and refined metal accessible on global markets. While Indonesia has added more than 1.5 million tonnes of new supply since 2020, production in Australia, the Philippines, and New Caledonia has contracted sharply, leaving stainless steel and alloy producers increasingly reliant on Indonesian output.

Concentration is a common thread heightening vulnerability across the three materials. In scrap, China is the largest user but contributes only a negligible share of global exports, reflecting a long-standing policy stance that includes a 40% export duty on ferrous scrap. Chromium is marked by extreme resource and production concentration: almost all chromite resources lie in southern Africa and Kazakhstan, while China dominates ferrochrome production despite having little domestic ore and relying fully on imports. Nickel ore production is similarly concentrated, with Indonesia and the Philippines accounting for over two-thirds of global output and Indonesia further dominating ferronickel production—patterns that make supply chains sensitive to shifts in a handful of jurisdictions. These patterns are reinforced by sizeable Chinese outward investment, which has anchored ferrochrome capacity in Southern Africa and nickel processing in Indonesia, thereby channelling supply through China-linked assets.

Policy risks are amplifying these structural pressures. In scrap, many economies have adopted restrictions, but only a modest share of global trade—about 15%—is currently affected. However, with the number of export restrictions and other policy measures that may affect scrap availability and trade on the rise, this may change in the coming period. In chromium, export restrictions imposed by South Africa and Zimbabwe already affect the bulk of global trade, as these two economies together account for close to 90% of world exports. While designed to promote local beneficiation and move up the value chain, these measures have tightened availability for stainless-steel producers that rely on imported ore. In nickel, Indonesia's ban on ore exports and complementary measures in the Philippines and other suppliers are similarly aimed at stimulating domestic smelting and battery-related investments. By limiting the tradability of ore, such policies increase the exposure of global stainless-steel and battery industries to decisions taken in a few resource-rich countries, raising the risks of price volatility, shortages and strategic dependencies.

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Endnotes

[1] See also the corresponding scoping note (OECD, 2025[138]).

[2] “Melt shop production” refers to the volume of molten stainless or heat-resisting steel produced in the melt shop, expressed as ingot or slab equivalent.

[3] Xinganglian (新钢联冶金有限公司)

[4] Reserves refer to economically recoverable deposits under current conditions, whereas resources denote the broader geological endowment. While Zimbabwe accounts for ~19% of global chromite reserves, it only detain 12% share of global chromite resources.

[5] Nickel is mainly used in stainless steel, especially austenitic grades (about 70% of stainless steel), which typically contain 8–12% nickel. In high-corrosion applications, nickel content can rise to 35%. Duplex stainless steels use 1.35–8% nickel, while precipitation-hardening grades contain 2–5%. Although stainless steel does not require nickel by formula, the most widely used grades rely heavily on it, with few substitutes that avoid performance trade-offs.

[6] Laterite ores typically contain 1.3–2.2% nickel and are divided into two types. Limonites, richer in iron and cobalt, are processed through hydrometallurgical methods such as HPAL, producing intermediates like nickel oxide sinter. Saprolites, lower in iron but richer in nickel and magnesium, are processed through pyrometallurgical routes to yield ferronickel or nickel pig iron (NPI), which serve as the main inputs for stainless steel production.

[7] An alternative pathway involves converting nickel pig iron (NPI) or ferronickel into nickel matte, which can then be refined into nickel sulphate. This route, pioneered in Indonesia since 2021, is less common than HPAL but provides a supplementary channel linking laterite-based Class 2 production to the battery supply chain.

[8] Tailings are the finely ground, slurry-like residues left after ore processing. They contain water, residual acids, and other by-products, and must be stored or treated to prevent environmental contamination. In the case of HPAL, tailings amount to about 1.4–1.6 tonnes for each tonne of nickel produced.

[9] Article 46 of MEMR Regulation No. 25/2018

[10] MEMR Regulation No. 25/2018 and MOT Regulation No. 96/2019