



The Role of Trade Policy in Shaping Global Minerals and Base Metals Trade

Introduction

Trade policy encompasses the rules and strategies that a country adopts to regulate its international trade. It includes a range of measures designed to manage imports, exports, and the flow of foreign investments. These policies shape the terms of trade, determining how countries interact with global markets and with each other. Through tariffs, trade agreements, and various regulatory frameworks, trade policies influence the movement of goods, services, and capital across borders. They are key in fostering economic growth, protecting domestic industries, and promoting international cooperation. The main contents of trade policy include tariffs, duties, and non-tariff barriers (NTBs). Tariffs are taxes imposed on imports to protect domestic industries or generate revenue, while NTBs may include quotas, licensing requirements, and regulatory standards. Additionally, trade agreements, such as bilateral or multilateral deals, help reduce barriers and increase market access. Countries also implement export incentives and import restrictions, along with measures such as subsidies to enhance domestic competitiveness. Intellectual property rights (IPR) protection and trade remedies, of which examples include anti-dumping and countervailing duties, ensure fair trade practices. Strategic trade policies, including support for emerging industries and resource management, are often used to achieve long-term economic objectives.

Trade policy serves as a critical tool for managing a country's economic relations with the rest of the world. By setting the rules for trade, investment, and competition, it ensures that both domestic and global markets operate efficiently and equitably. Trade policies also adapt over time to reflect changing economic priorities, global trends, and geopolitical factors. Effective trade policies can foster sustainable growth, encourage innovation, and promote the fair exchange of goods and services internationally.

Table 1: Categories of Trade Policies and Their Main Contents

Category	Description
Tariffs and Duties	- Import Tariffs – Taxes on imports.
	- Export Duties – Taxes on exports.
	- Customs Procedures – Valuation, classification, and duty collection.
Non-Tariff Barriers (NTBs)	- Quotas – Limits on import/export quantities.
	- Licensing – Permits for trade of specific goods.
	- Standards and Regulations – Technical, sanitary, and safety standards.
	- Subsidies – Financial aid to domestic industries.
Trade Agreements	- Bilateral Agreements – Trade deals between two countries.
	- Multilateral Agreements – Involving multiple nations (e.g., WTO).
	- Free Trade Agreements (FTAs) – Elimination of tariffs/barriers.
	- Preferential Trade Agreements (PTAs) – Special trade terms.
Export-Import Policies	- Export Incentives – Tax breaks or subsidies to boost exports.
	- Export Controls – Restrictions for national security or economic reasons.

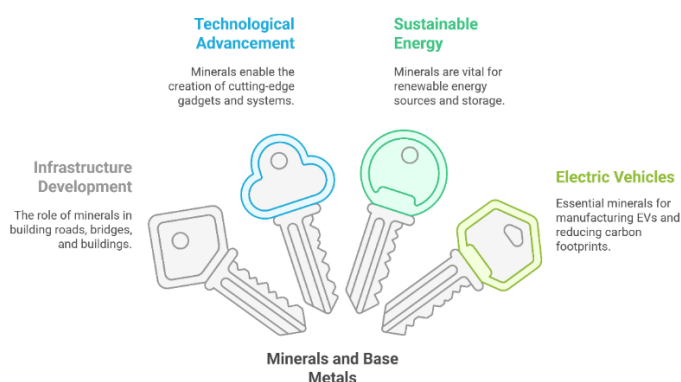
Investment and Trade Facilitation	- FDI Rules – Regulations on foreign investments.
	- Trade Facilitation – Streamlining customs and reducing costs.
Intellectual Property Rights (IPR)	- Patents and Copyrights – Protection of innovation.
Trade Remedies	- Anti-Counterfeiting – Measures against counterfeit goods.
	- Anti-Dumping Measures – Preventing underpriced imports.
	- Countervailing Duties – Offsetting foreign subsidies.
	- Safeguards – Protecting industries from import surges.
Strategic Trade Policies	- Infant Industry Protection – Support for emerging industries.
	- Resource Management – Export bans or quotas on scarce resources.
Sustainability and Environment	- Green Trade Policies – Incentives for eco-friendly goods.
	- Carbon Border Adjustment – Tariffs based on carbon emissions.
Dispute Resolution	- Trade Dispute Mechanisms – Resolving conflicts through WTO or other means.

Trade Policies and Regulations



Minerals and base metals are fundamental to the functioning of modern economies and industries. These materials—such as copper, lithium, cobalt, nickel, zinc, lead and rare earth elements—are the building blocks of industrial development. They are crucial for the construction of infrastructure, the creation of technology, and the advancement of sustainable energy systems. In particular, the importance of minerals and base metals has grown exponentially in recent years due to their role in emerging sectors such as electric vehicles (EVs), renewable energy, and battery storage technologies.

Essential Role of Minerals & Base Metals for Modern Infrastructure and Sustainable Innovation

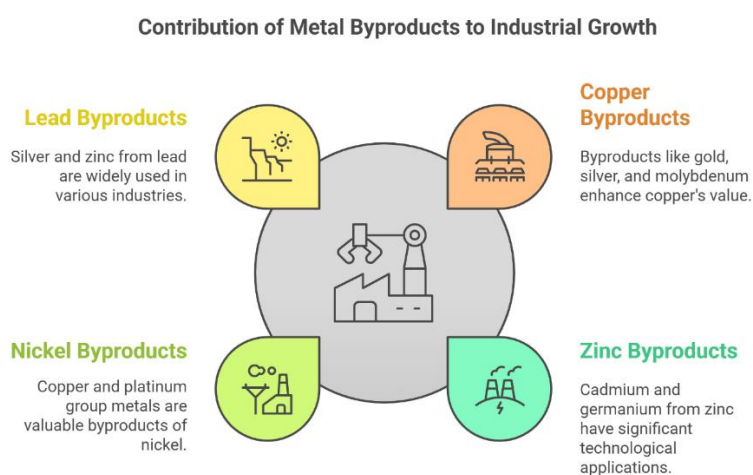


The role of base metals in industrial growth cannot be overstated. As the primary materials used in the construction of buildings, bridges, transportation infrastructure, and machinery, base metals like steel, aluminum, copper, and zinc are central to the development of modern infrastructure. For example, copper is essential in the manufacturing of wiring for electrical systems, while steel is crucial for the construction of bridges, buildings, and vehicles. These materials are not only used in large-scale infrastructure projects but are also key components in the production of everyday products like automobiles, household appliances, and electronic devices.

Base metals and minerals are indispensable to the development and proliferation of modern technologies. Electronics—such as smartphones, computers, and televisions—rely on metals like copper, gold, and rare earth elements. These materials are used in the manufacturing of conductors, circuits, and batteries, all of which are essential for the functioning of high-tech devices. As technology continues to advance, the demand for these metals is expected to increase, as newer products require higher quantities of critical materials to support their performance.

One of the most significant and rapidly growing areas of mineral demand is the green energy transition. With the world moving away from fossil fuels in favour of renewable energy sources, minerals and base metals are becoming even more important. Lithium, cobalt, and nickel are essential for producing the batteries that power electric vehicles and store energy generated by solar and wind power. Copper, as a highly efficient conductor, is needed for the construction of electric grids, wind turbines, and solar panels. These materials are also key in the development of energy-efficient technologies, such as advanced batteries for energy storage and electric propulsion systems.

In addition to the base metals themselves, the byproducts and coproducts of the base metals are also indispensable in global industrial growth, technological advancement, and the green energy transition. Byproducts of copper mining, such as gold, silver, and molybdenum, have significant industrial and financial value. Gold and silver are used in the electronics industry, while molybdenum is used to strengthen steel and other alloys. These byproducts enhance the economic feasibility of copper extraction and play important roles in other industrial applications. Byproducts of zinc mining, such as cadmium and germanium, also have significant applications in technology. Cadmium is used in rechargeable batteries and solar panels, while germanium is used in fiber optics and infrared optics. These byproducts increase the overall value of zinc mining operations and contribute to the technological growth of multiple sectors. Byproducts of nickel mining, including copper and platinum group metals (PGMs), are of considerable value. Copper, as mentioned, is used in a wide variety of industrial applications, while PGMs, such as platinum and palladium, are essential in catalytic converters for the automotive industry and in fuel cell technologies. Byproducts of lead mining include silver and zinc, which have broader applications in industries like electronics, manufacturing, and energy production. Silver, for example, is widely used in the production of solar panels and in electronics, while zinc is important for galvanizing metals.



The green energy transition is driving a surge in demand for these minerals. As countries push for carbon neutrality and greater reliance on clean energy, the production and trade of critical minerals are poised to play a central role in shaping the future of the global economy. However, this transition also poses challenges in securing a steady supply of these resources. Many of the key minerals are concentrated in a few countries or security-fragile regions, which creates vulnerabilities in the global supply chain and has made resource management a key area of concern for policymakers and industry leaders alike.

Trade policy plays a critical role in shaping the global trade of minerals and metals, especially as countries navigate the complex dynamics of resource extraction, processing, and distribution. Minerals and metals, vital for a wide range of industries such as electronics, construction, and green energy, are directly impacted by national trade policies that regulate their movement across borders. These policies—such as tariffs, export restrictions, and trade agreements—affect everything from raw material costs to the competitiveness of industries reliant on these resources. Countries use trade policy to either protect domestic industries or seek global partnerships, with a major focus on managing the flow of critical minerals and metals.

Indonesia's trade policies have had a significant impact on the global nickel market, particularly through its restrictions on nickel exports and its shift towards value-added processing. In 2020, Indonesia implemented a ban on the export of unprocessed nickel ore, aiming to boost domestic smelting and refining capacities, thus encouraging the production of higher-value products like refined nickel. This policy shift was designed to foster a more robust domestic nickel industry, attract foreign investment, and create jobs, while also supporting the country's ambition to become a key player in the electric vehicle (EV) battery supply chain. As a result, the global nickel market experienced supply disruptions, leading to price increases and shifts in trade flows, with countries like China increasing investment in Indonesia's nickel processing sector. Overall, Indonesia's trade policies have elevated its role in the global nickel market, but have also introduced uncertainties that influence global supply chains and pricing dynamics.

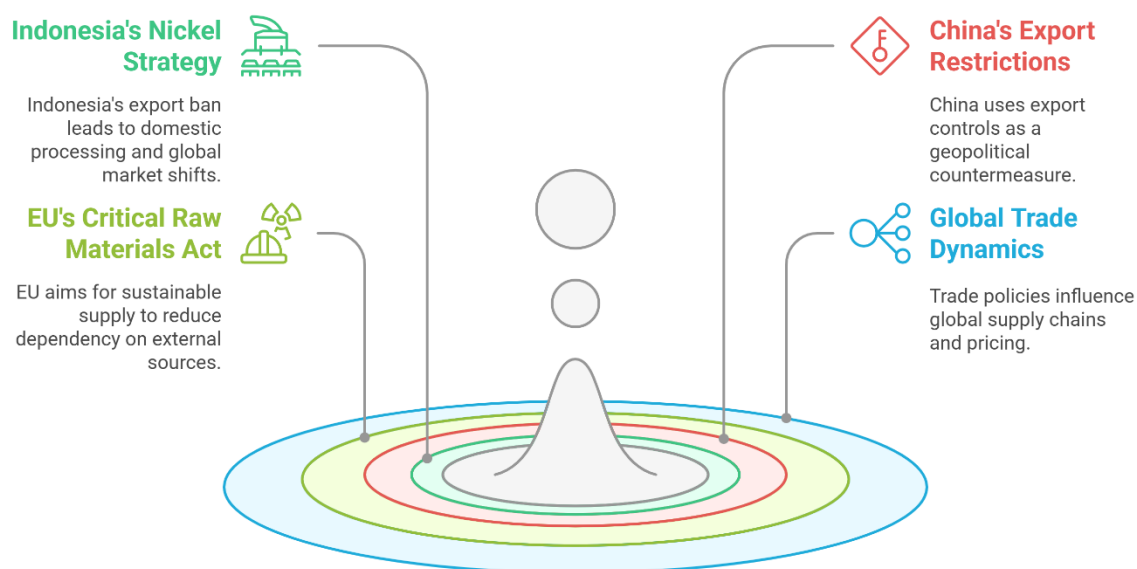
China's recent export restrictions on rare earth metals and other critical materials are largely a reaction to the U.S. led export controls on advanced technologies, including semiconductor manufacturing equipment and chips, which target China. In response to U.S. efforts to limit China's access to cutting-edge chip-making technologies, China has leveraged its dominance in rare earths and other essential metals as a strategic tool in the broader geopolitical trade war. By imposing export curbs, China aims to ensure its control over key resources used in the production of technology, electronics, and defense equipment. This strategic use of export restrictions serves both as a countermeasure to the U.S.'s technological sanctions and as a means of maintaining a competitive advantage in the global supply of critical minerals and metals. As a result, these trade policies can disrupt global supply chains, raise prices, and create uncertainty in industries reliant on these materials.

On the other hand, trade agreements and international cooperation remain essential for stabilizing the global minerals and metals trade. Bilateral and multilateral trade deals help reduce barriers to trade, enabling countries to secure access to essential resources and more efficiently market their products. For instance, the European Union's Critical Raw Materials Act seeks to ensure that the EU has a sustainable and secure supply of essential minerals, thereby reducing dependence on external sources like China. Similarly, free trade agreements (FTAs) can reduce tariffs and open up access to markets, benefiting industries involved in green technologies, such as electric vehicle manufacturers and renewable energy infrastructure. However, as evidenced by the tensions between the U.S. and China, trade policy in the minerals and metals sector can also be shaped by strategic considerations, with countries using trade measures to protect their technological and economic interests. Intellectual property protections and fair-trade practices also play an important role in ensuring that innovations in metal processing or mining technologies benefit the countries that produce these materials.

Trade policy is a powerful tool in determining the direction of the global minerals and metals market, influencing everything from supply chains to pricing and international relations. The strategic use of

export controls, such as China's reaction to U.S. restrictions on semiconductor technology, demonstrates how trade policies are increasingly intertwined with geopolitical power dynamics. As countries navigate these tensions, the global minerals and metals trade is shaped by efforts to balance economic growth, resource management, and security concerns. Effective trade policy will be essential in managing these complex relationships and ensuring that industries worldwide have stable access to the critical materials needed for technological innovation and sustainable development.

Trade Policy Impacts on Minerals and Metals



In order to assist member countries to explore how trade policy impacts the global minerals and base metals trade and to understand its broader economic, geopolitical, and environmental implications, the secretariat developed this Insight Paper examining how trade policy mechanisms such as tariffs, export restrictions, trade agreements, and foreign direct investment (FDI) regulations influence the minerals market and providing a comprehensive analysis of the ways in which trade policy shapes the global flow of critical resources. At the same time, this paper aims to contribute to a deeper understanding of how nations and industries can navigate the evolving landscape of mineral trade. This is increasingly crucial in the context of the green energy transition and the growing demand for critical minerals.

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1. Tariffs and Duties

A. How import/export taxes affect the pricing and availability of base metals

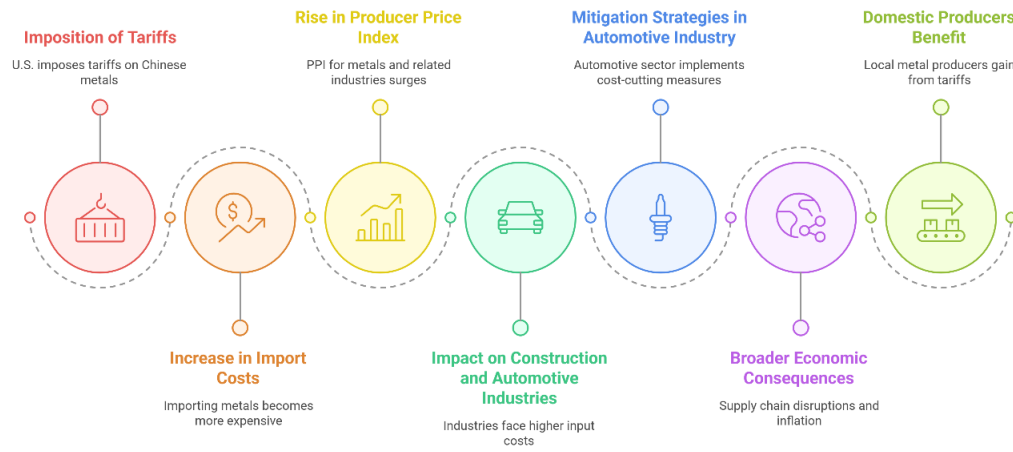
Tariffs and duties on base metals play a significant role in shaping their pricing, availability, and broader economic and environmental impacts. By examining various case studies, we can better understand how these policies affect industries, trade relationships, and sustainability.

Tariffs and duties directly increase the cost of importing base metals, leading to price hikes in industries such as construction, automotive, and electronics. For instance, during the U.S.–China Trade War (2018–2020), the U.S. imposed tariffs of 10–25% on Chinese aluminum and steel, causing production costs for U.S. manufacturers to rise significantly. The Producer Price Index (PPI) measures the average change in prices received by domestic producers for their output, and the Section 232 tariffs on steel and aluminum, imposed in 2018, had a significant impact on PPI hikes in the United States. These tariffs were intended to protect domestic industries by making imported steel 25% more expensive and aluminum 10% more costly, thereby encouraging domestic production. However, the immediate consequence was a substantial increase in input costs for industries reliant on these metals. The PPI for iron and steel mills surged from 168.2 in 2017 to 191.4 in 2018, a 13.8% increase, while aluminum sheet, plate, and foil manufacturing experienced a 12.1% rise, climbing from 181.9 to 203.9. The increase was directly attributable to the tariffs, as they restricted access to cheaper foreign imports, forcing domestic producers to raise prices in response to higher demand and supply constraints.

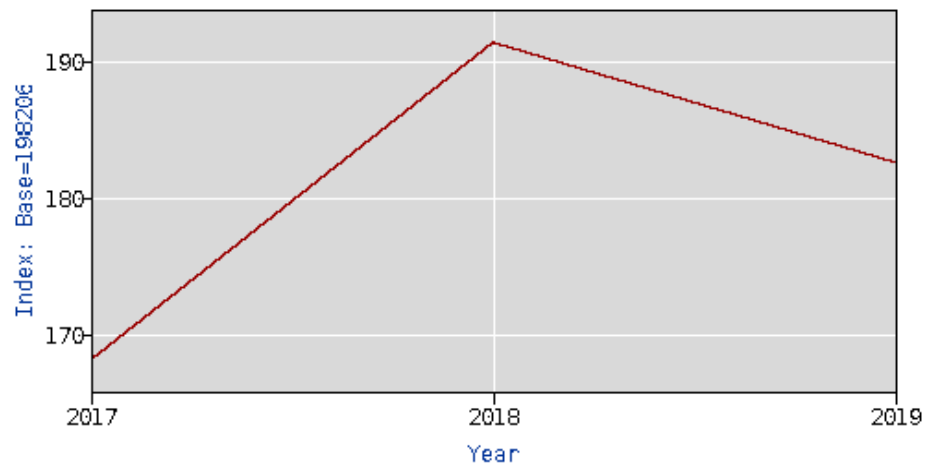
The rise in steel and aluminum prices created a ripple effect throughout the economy, particularly impacting downstream industries such as automobile manufacturing, construction machinery production, and consumer electronics. The PPI for construction machinery rose from 248.4 in 2017 to 262.1 in 2019, reflecting the direct pass-through of higher steel and aluminum costs to manufacturers. While automobile manufacturers faced similar cost pressures, they managed to keep PPI increases relatively modest, rising only slightly from 152.1 in 2017 to 153.6 in 2019. This stability was largely due to cost-cutting measures, efficiency improvements, and supply chain adjustments, which helped mitigate the full impact of rising metal prices. However, these industries still faced financial strain as they absorbed a portion of the increased costs rather than fully passing them on to consumers.

Beyond individual industries, the Section 232 tariffs had broader economic consequences, disrupting supply chains and increasing inflationary pressures. Higher production costs forced businesses to reevaluate pricing strategies, and in many cases, those costs were passed on to consumers, contributing to overall inflation. Additionally, the tariffs reduced competition by limiting access to international suppliers, which further exacerbated price hikes. Domestic steel and aluminum producers benefited from the protectionist measures, enjoying higher demand and increased pricing power, but these gains came at the expense of industries reliant on affordable metals.

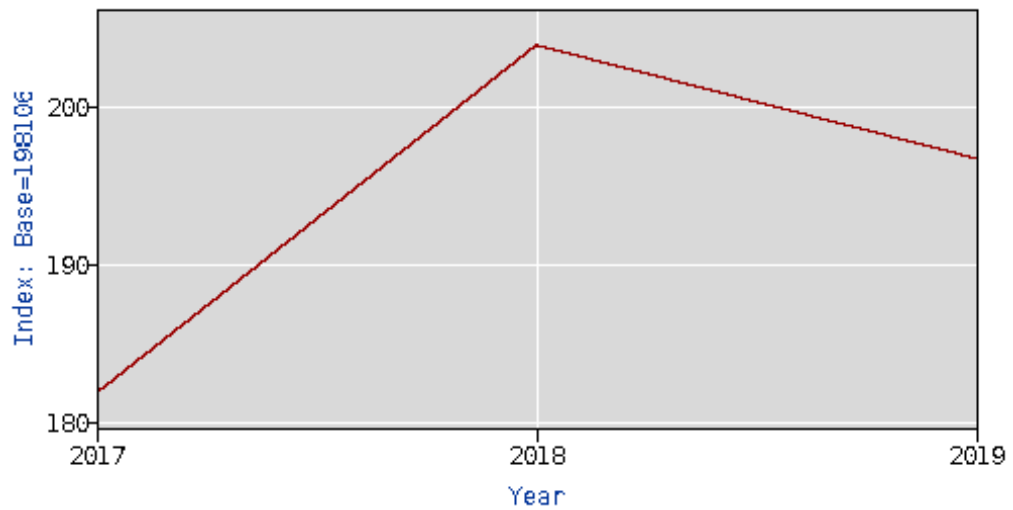
Impact of Tariffs on Metal Prices and Economy



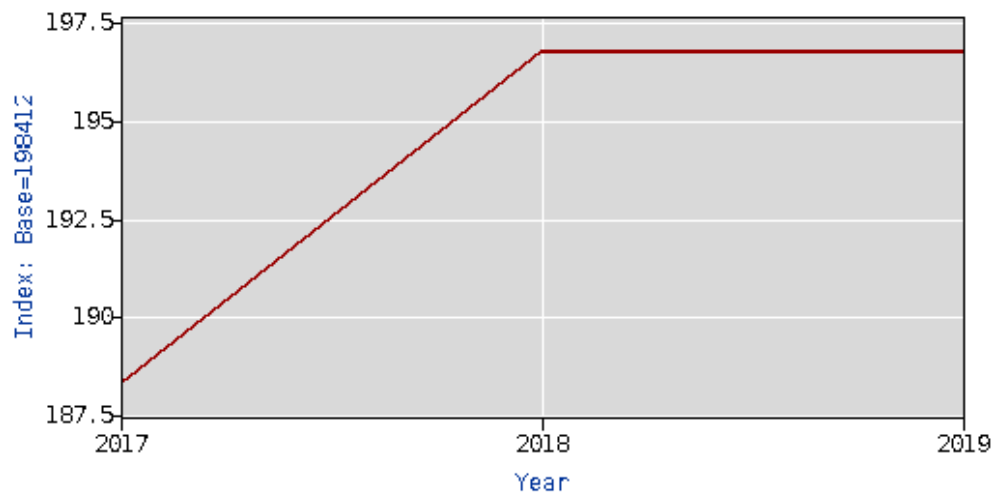
Iron and steel mills and ferroalloy mfg PPI



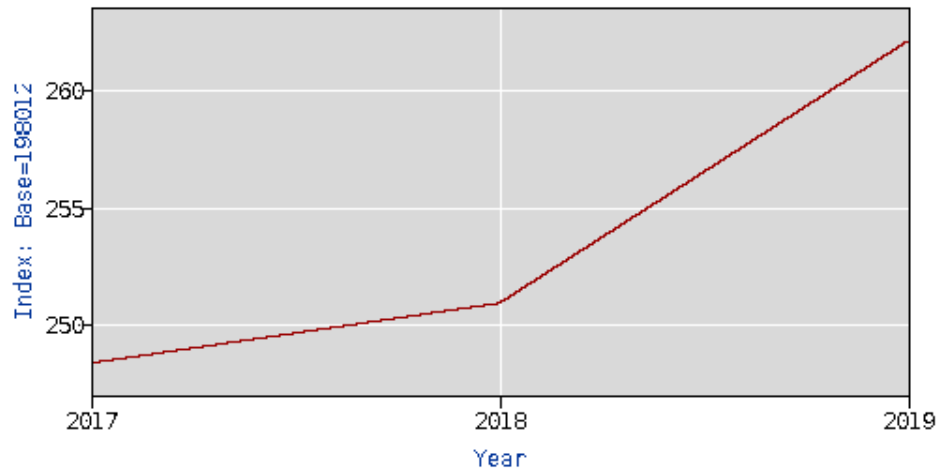
Aluminum sheet, plate, and foil mfg PPI



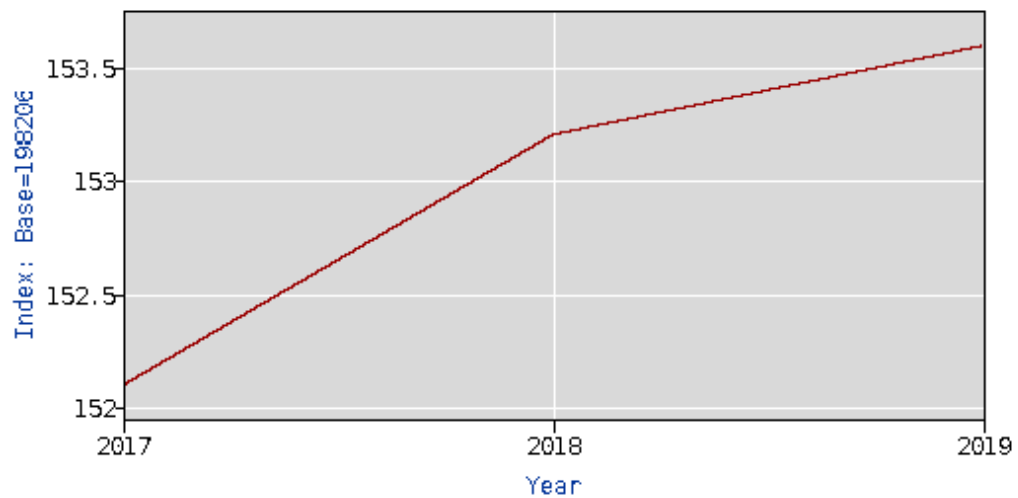
Total manufacturing industries PPI

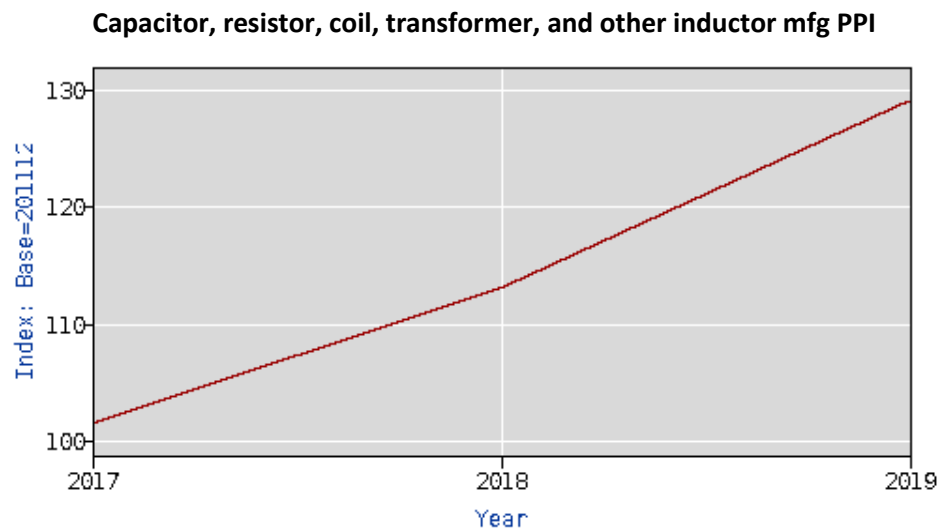


Construction machinery mfg PPI



Automobile, light truck and utility vehicle mfg PPI

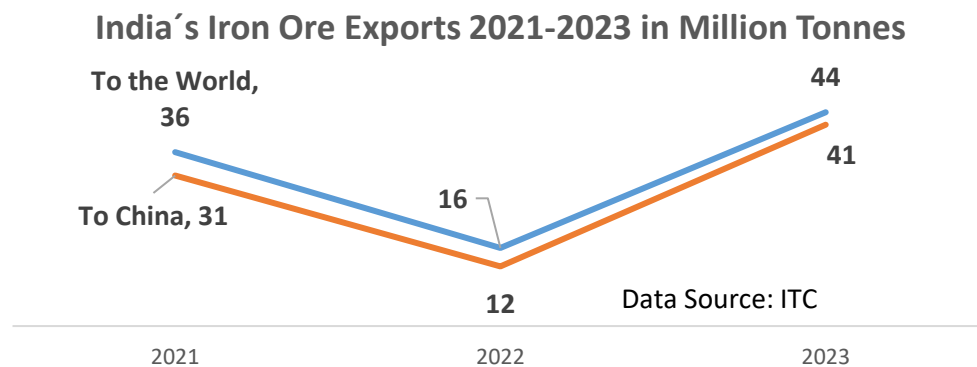




Source: US Bureau of Labor Statistics

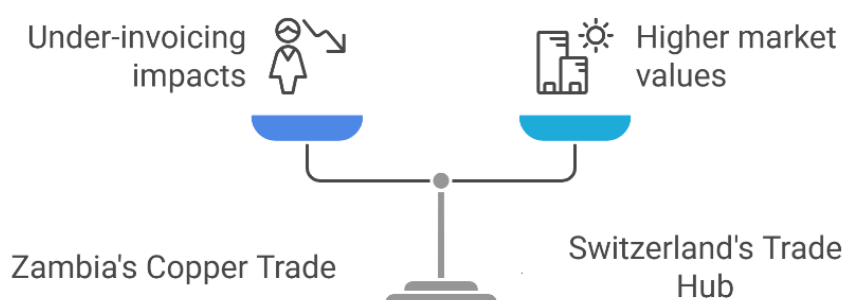
B. Tariffs and export duties can reduce the availability of base metals in global markets, especially in countries reliant on imports.

India's 50% export tariff on iron ore, imposed in May 2022 to ensure domestic supply for its steel industry, was revoked in November 2022 as part of a broader policy adjustment. Along with the 50% duty on iron ore lumps and fines, a 45% tariff on iron ore pellets was also removed, reverting to pre-May 2022 policies. The decision was driven by declining exports, weakening global demand—particularly from China—and pressure from the domestic mining industry, which argued that the tariff hurt competitiveness and foreign exchange earnings. Since the removal, India's iron ore exports have rebounded, especially to China, which relies on Indian low-grade ore for steel production. The reversal has also helped stabilize global prices and provided relief to Indian miners and exporters. Domestically, it has improved the mining sector's competitiveness, while globally, it has eased supply constraints. The brief imposition of the tariff, lasting only six months, highlights how swiftly policy changes can impact global commodity markets and trade. Currently, there is no export tariff on iron ore or pellets from India, allowing exporters to operate without additional duties, which has reinforced India's role as a key supplier in the global market.



C. The impact of customs procedures—valuation, classification, and duty collection—on trade flows of base metals

Customs procedures—valuation, classification, and duty collection—are crucial in shaping the trade flows of base metals like lead, zinc, nickel, and copper by influencing costs, efficiency, and predictability. Valuation discrepancies, especially for metals with fluctuating prices like copper and nickel, can lead to disputes, delays, and financial distortions. Zambia, an important copper producer, has faced significant losses due to under-invoicing in its copper trade. Exporters declare lower prices than actual market values to reduce taxes and royalties, shifting profits offshore. A UNCTAD Study titled “Trade Mis invoicing in Primary Commodities in Developing Countries” revealed that between 1995 and 2014, Zambia’s reported copper exports were significantly lower than the values recorded in Switzerland, a key trading hub. This mis invoicing resulted in billions of dollars in lost government revenue, reducing funds for infrastructure, healthcare, and education. It also distorted trade statistics, weakened foreign exchange earnings, and increased Zambia’s reliance on external loans. In response, Zambia has strengthened regulations, increased mining royalties, and improved trade monitoring through initiatives like the Extractive Industries Transparency Initiative (EITI). By enforcing stricter policies and enhancing international cooperation, Zambia aims to curb trade mis invoicing, ensuring greater revenue transparency and sustainable economic growth from its copper exports.



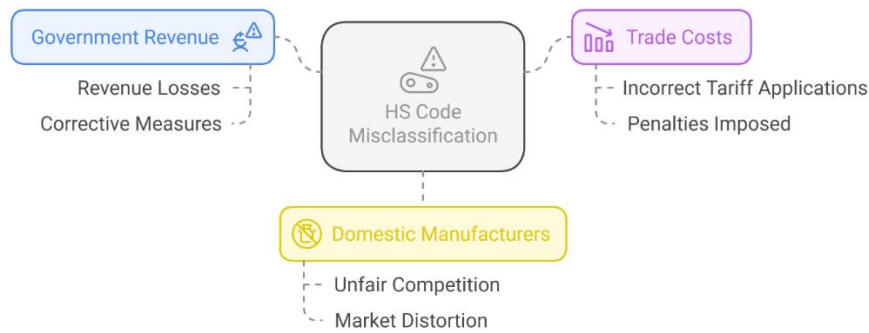
UNCTAD Findings: Imbalancing Trade Valuation

Zambia's Response to Trade Mis-invoicing



The Harmonized System (HS) is a standardized classification system for traded goods, determining customs duties and trade policies. Misclassification under HS codes can lead to incorrect tariff applications, affecting government revenues and trade costs. A notable example occurred in India's zinc alloy imports. In 2019, India's tax authorities uncovered a case where exporters misclassified zinc alloy products as unwrought zinc (HS Code 7901), allowing them to pay lower import duties compared to the correct classification under zinc alloys (HS Code 7903). This misclassification resulted in significant revenue losses for the Indian government and unfair competition for domestic zinc alloy manufacturers. Through audits and checks, authorities detected the discrepancies in customs declarations. As a result, penalties were imposed on the involved companies, and corrective duties were levied. This case highlighted the crucial role of accurate HS code classification and the need for stricter enforcement to prevent trade mis invoicing, ensuring fair competition and protecting government revenues.

Impact of HS Code Misclassification on Trade



Duty collection is another determinant of trade efficiency; unpredictable or high tariffs can deter trade, while streamlined systems encourage it. The International Trade Centre (ITC, 2019) reported that nations implementing automated duty collection and pre-clearance procedures experienced higher trade volumes. To facilitate metal trade, governments should enhance automation, transparency, and capacity-building efforts in customs operations. Efficient processes would improve trade predictability and cost-effectiveness, ensuring a smoother global supply chain for critical base metals. By addressing valuation inconsistencies, classification errors, and inefficient duty collection, trade flows can be optimized, benefiting both economies and industries reliant on these essential commodities.

Optimizing Trade Flows through Customs Efficiency



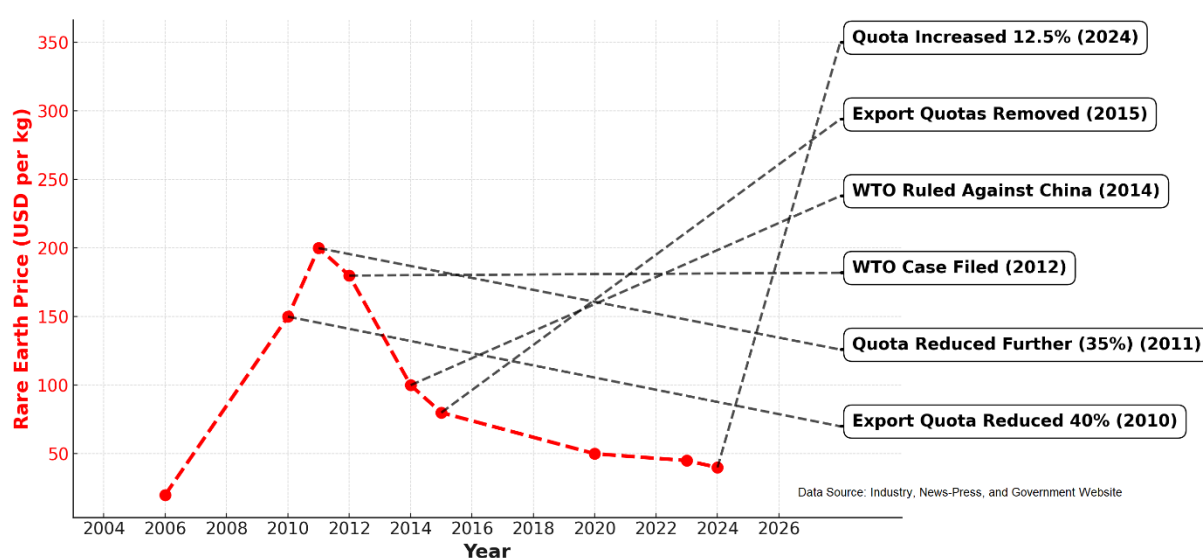
2. Non-Tariff Barriers (NTBs)

- A. Quotas are limits set by a country on the quantity of a specific good that can be imported or exported. They help protect domestic industries from foreign competition.

China's rare earth export quotas in the 2000s and early 2010s had significant environmental, economic, and geopolitical consequences, reshaping global supply chains and trade policies. Rare earth elements (REEs) are essential for advanced technologies, including electronics, renewable energy systems, and defense applications. As the world's leading producer, China's decision to impose quotas on rare earth exports affected the global markets. The quotas were justified on environmental grounds, as rare earth mining produces toxic waste, radioactive byproducts, and severe ecological damage. The policy also aimed to conserve resources for future domestic use and curb illegal mining and smuggling, which had led to unregulated extraction and loss of state revenue. However, beyond these justifications, the quotas served broader strategic goals. By restricting exports, China secured a stable and affordable supply of rare earths for its own industries, supporting its shift from a raw material supplier to a high-tech manufacturing powerhouse. The policy also reinforced China's leverage over global markets, using its dominance in rare earth production as an economic and trade countermeasures.

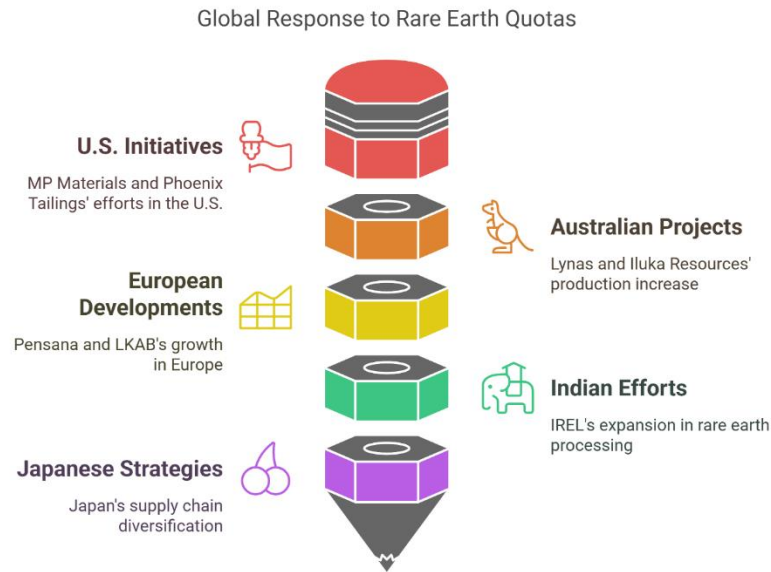
The export restrictions also involved a tit-for-tat dynamic in international trade. The quotas were a response to restrictions imposed by Western countries on high-tech exports to China, particularly in areas such as semiconductors and defense-related technologies. The quotas effectively gave China bargaining power, as industries worldwide, including electronics and defense manufacturers in the U.S., Japan, and Europe, depended on a stable rare earth supply. In retaliation, major economies challenged China's policy at the World Trade Organization (WTO), arguing that the quotas violated international trade agreements. In 2014, the WTO ruled against China, stating that the restrictions were inconsistent with global trade rules. As a result, China lifted the quotas in 2015 but continued to exert control over the industry through production caps, environmental regulations, and consolidation of mining companies. The tit-for-tat nature of trade restrictions, particularly between China and Western nations, remains a key theme in international economic relations, influencing policies on rare earths, semiconductors, and other critical technologies.

Rare Earth Price Trends with Major Events



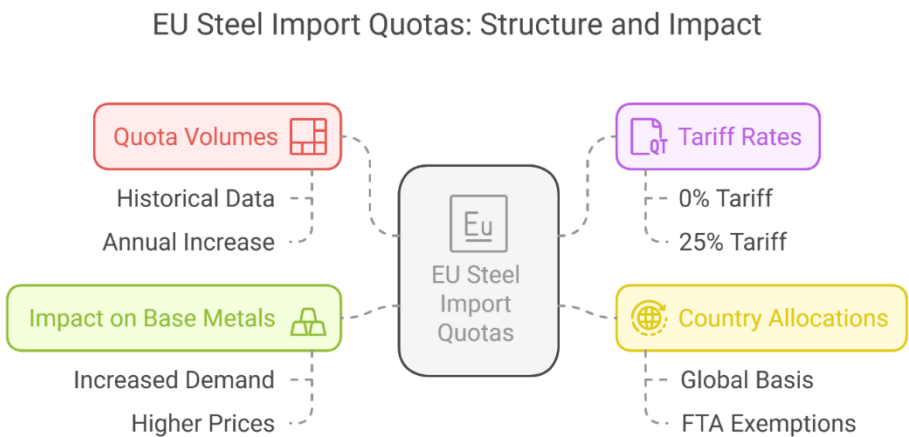
The impact of these quotas was profound, driving rare earth prices to record highs and triggering a global scramble to secure alternative sources. In recent years, major economies have increased investment in rare earth mining, refining, recycling and alternative materials. In the U.S., MP Materials is developing the Mountain Pass mine, while Phoenix Tailings is building a rare earth facility. Australia's Lynas and Iluka Resources are increasing production, with government-backed projects. Europe should see growth with Pensana in the UK and LKAB in Sweden. India's IREL is expanding processing, and Greenland's Tanbreez project has U.S. backing. Japan, one of the hardest-hit importers, has signed

agreements with other rare earth producers to diversify its supply chain.



Import quotas on base metals have significant implications for both domestic industries and global supply chains. These quotas are typically imposed by countries to protect local industries, reduce reliance on foreign imports, and foster self-reliance. While the primary goal of import quotas is to shield domestic markets from foreign competition, they often come with the unintended consequence of raising costs for downstream industries that rely on these base metals for manufacturing.

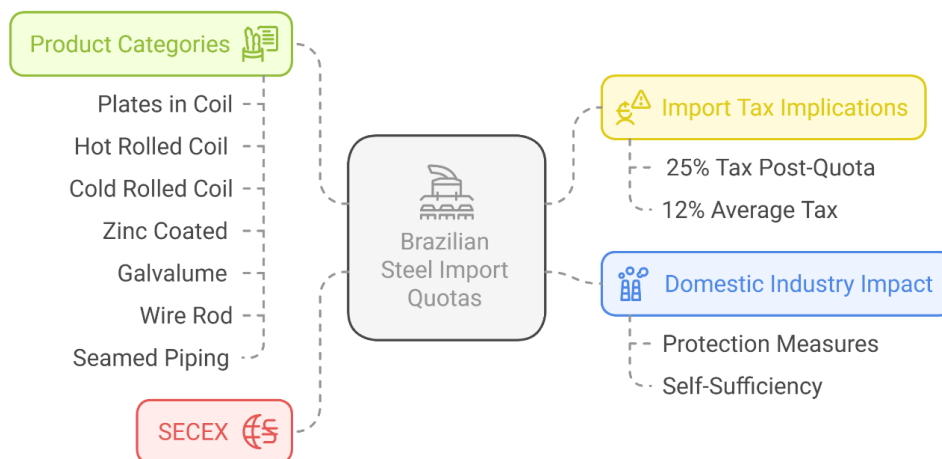
For instance, the European Union (EU) imposed import quotas on steel products starting in 2018, primarily in response to U.S. Section 232 tariffs on steel and aluminum. These quotas indirectly affected base metals like zinc and nickel, which are critical components in galvanized steel production and stainless steel production. By limiting the volume of steel imports, the EU aimed to protect its domestic steel industry from a surge of imports, especially from countries affected by U.S. tariffs. However, the quotas also led to increased costs for industries that use zinc and nickel-containing steel products in their operations, such as construction, automotive, and electronics, where steel is an essential raw material. The increased prices for these base metals, in turn, added to the overall cost structure for businesses reliant on zinc and nickel-containing steel, highlighting how quotas on one material can have ripple effects throughout the supply chain.



In 2024, The Brazilian foreign trade authority, SECEX, introduced import quotas on zinc-coated flat-rolled products. This measure aimed to protect local producers from foreign competition and stabilize the domestic market. By restricting imports, Brazil's reliance on local production increased, reducing competition and potentially leading to higher prices for zinc-coated products. This could result in

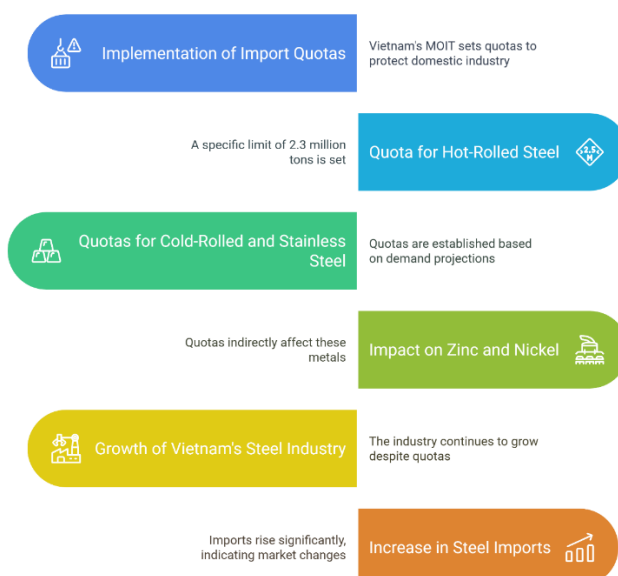
increased costs for the automotive, construction, and appliance industries with the possibility of higher prices being passed on to consumers. The impact extends to the zinc market as well, with Brazil's increased demand for locally produced zinc potentially driving up both domestic and global zinc prices.

Brazil's Steel Import Quotas and Economic Strategy



In 2020, the Vietnamese Ministry of Industry and Trade (MOIT) implemented quotas on certain steel products to protect its domestic industry from a surge of imports. Vietnam set an import quota of 2.3 million tons for hot-rolled steel products for the year 2020. Once this quota was reached, higher tariffs were imposed on additional imports to discourage further entry of foreign steel at below-market prices. Import quotas were established for cold-rolled steel products, with specific limits determined based on annual demand projections. Import quotas were also applied to stainless steel products to protect local production, especially for products used in the construction and manufacturing sectors. Though these measures didn't directly target zinc and nickel, its impact on the two metals are apparent. As of the latest updates, Vietnam's steel industry has continued to grow, with significant increases in both production and imports. For instance, in 2024, Vietnam's steel imports reached 14.709 million tons, a 38.17% increase compared to the previous year, indicating a shift in the market dynamics since the 2020 quota implementation. This growth suggests that while the 2020 quotas were effective in the short term, the long-term demand for steel and related metals has continued to rise, driven by infrastructure development and industrial expansion

Vietnam's Steel Import Quota Implementation and Impact



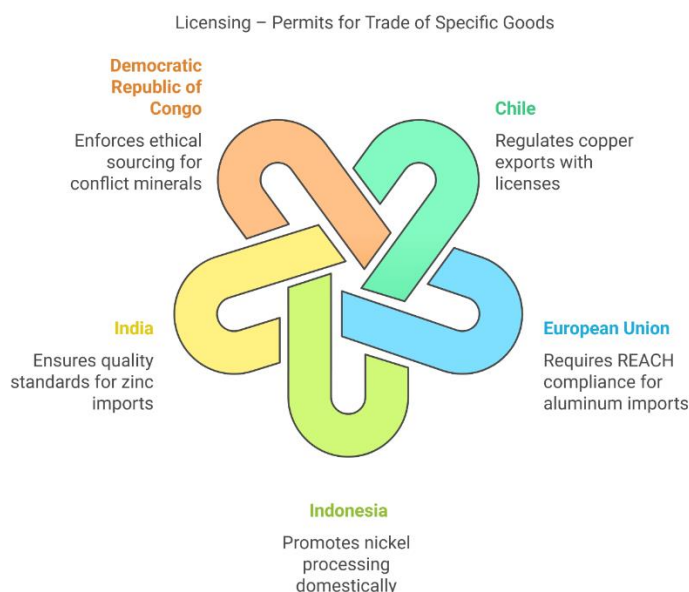
In summary, while import quotas on base metals are often used to protect domestic industries and promote self-reliance, they lead to increased costs for industries that depend on these metals. The ripple effect on zinc, nickel, copper, and other base metals can disrupt global supply chains, leading to higher prices for manufacturers and consumers alike. These measures, although beneficial to local producers, often create trade tensions and put pressure on industries that rely on imported raw materials for production.

B. Licensing – Permits for Trade of Specific Goods

Licensing and permits for the trade of specific goods, particularly base metals, are critical components of international trade regulation. Base metals, which include metals such as copper, aluminum, nickel, zinc, lead, and tin, are essential for various industries, including construction, electronics, and manufacturing. The trade of these metals is often subject to specific licensing requirements to ensure compliance with national and international laws, environmental regulations, and trade policies.

Global trade in base metals is significantly shaped by specific licensing and permitting regimes that governments deploy to manage exports and imports while advancing domestic economic objectives and ensuring compliance with quality and ethical standards. In Chile, for instance, copper exporters must obtain a “Chilean Export License” issued by the Chilean Copper Commission (COCHILCO), which verifies that shipments align with national guidelines and strategic resource management goals, thereby regulating export volumes and safeguarding national sovereignty. Similarly, the European Union requires aluminum importers to secure an “EU Import Permit” that is integrated with a REACH Compliance Certificate, ensuring that imported aluminum meets stringent quality and safety standards while supporting domestic industry competitiveness. Indonesia employs a distinctive approach with its nickel trade: raw nickel ore is banned from export, and only firms that obtain a “Processed Nickel Export License” along with a “Domestic Processing Permit” – demonstrating their commitment to developing local smelting and refining capabilities – are allowed to export processed nickel products, thus driving domestic value addition. In India, zinc importers are mandated to register for a “Zinc Import License” and provide evidence of compliance with quality standards certified by the Bureau of Indian Standards (BIS), ensuring that only products meeting national criteria are allowed into the market, thereby protecting local manufacturers from unfair competition. Meanwhile, in the Democratic Republic of Congo, exporters of conflict minerals such as tin, tungsten, and tantalum must secure a “Conflict Minerals Export Permit,” which is contingent on obtaining a Due Diligence Certification that confirms ethical sourcing practices in line with international guidelines. Collectively, these specific licensing and permitting frameworks not only regulate trade flows and encourage domestic processing but also

enforce environmental and ethical safeguards, contributing to the overall stability and integrity of the global base metals market.

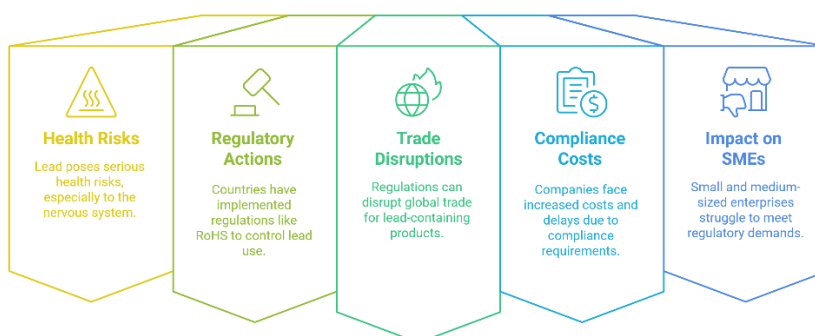


C. Standards and Regulations – Technical, Sanitary, and Safety Standards

Cross-border trade in base metals such as lead, zinc, nickel, and copper is vital to the global economy, supporting industries from construction and electronics to renewable energy and transportation. However, the movement of these metals is heavily influenced by technical, sanitary, and safety standards, which vary across different countries. While these standards are essential for ensuring product quality, protecting human health, and safeguarding the environment, they can also create significant barriers to trade, complicating market dynamics for both exporters and importers.

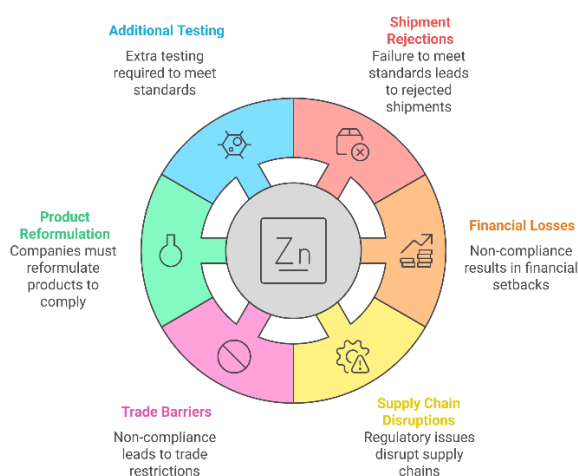
Lead, widely used in batteries, radiation shielding, and alloys, poses serious health risks, particularly to the nervous system. As a result, countries have implemented stringent regulations to control its use. For example, the European Union's RoHS Directive restricts lead in electronics, while the U.S. Environmental Protection Agency (EPA) enforces strict controls on lead emissions. These regulations can sometimes disrupt global trade, as seen when manufacturers of lead-containing products have encountered difficulties exporting to highly regulated markets like the EU. In some cases, companies faced shipment delays or rejections due to non-compliance with the RoHS Directive or other environmental regulations. This often requires manufacturers to invest significant resources into reformulating their products by reducing lead content or adopting alternative materials to meet regulatory standards. Additionally, businesses have had to undergo extensive testing and obtain new certifications to demonstrate compliance, leading to increased operational costs and delays. These challenges have particularly impacted small and medium-sized enterprises (SMEs) in developing countries, that often lack the resources to swiftly adapt to changing regulatory requirements. As a result, compliance barriers can limit their ability to compete in international markets, highlighting the broader challenges associated with navigating stringent environmental regulations.

Standards & Regulations Challenges on Lead Trade



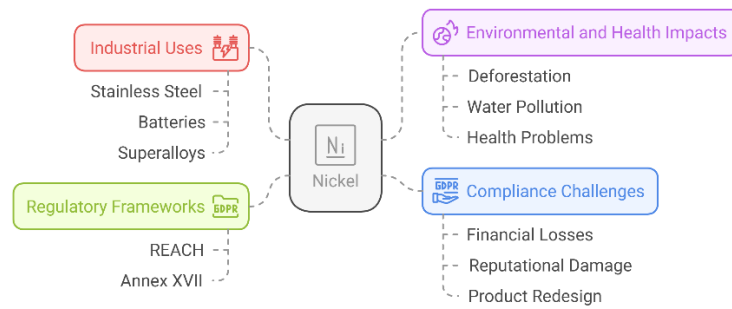
Zinc plays a crucial role in galvanizing steel to prevent corrosion and in the production of alloys and batteries. While less toxic than lead, the production and disposal of zinc can still pose environmental risks. To ensure quality and safety, international standards such as ISO guidelines and the ASTM (American Society for Testing and Materials) standards set specific purity requirements for zinc and its alloys. Compliance with these standards is essential for manufacturers and exporters, as failure to meet regulatory requirements can result in shipment rejections, financial losses, and supply chain disruptions. In industries requiring high-purity zinc alloys, strict limits on impurities such as cadmium and lead are enforced to maintain product performance and safety. Instances of non-compliance have led to trade barriers, requiring companies to invest in product reformulation and additional testing to meet market-specific regulations. This highlights the importance of adhering to international quality standards, as ensuring compliance not only facilitates smoother trade but also helps maintain strong business relationships and prevents costly delays.

Zinc Compliance and Trade Outcomes



Nickel is essential in the production of stainless steel, batteries, and superalloys; however, its mining and refining can lead to environmental issues such as deforestation and water pollution. Exposure to nickel may also cause health problems, including skin allergies and respiratory issues. To mitigate these risks, regulations such as the European Union's REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) framework enforce strict controls on nickel usage, particularly in products that come into direct and prolonged contact with the skin, like jewelry. Under REACH Annex XVII, nickel release from jewelry is restricted to a maximum of $0.5 \mu\text{g}/\text{cm}^2/\text{week}$ to prevent allergic reactions. Non-compliance with these standards can lead to significant consequences for exporters, including financial losses, reputational damage, and strained relationships with retailers. Companies may need to invest in product redesign or alternative materials to meet these stringent health and safety standards, ensuring compliance in regulated markets.

Nickel: Industrial Importance and Regulatory Challenges



Copper is essential for electrical wiring, electronics, and renewable energy but faces environmental scrutiny due to the pollution caused by its mining and refining processes. Copper smelting, in particular, can produce significant sulfur dioxide (SO₂) emissions, which contribute to air pollution and acid rain. To address these environmental concerns, regulatory frameworks such as the European Union's Industrial Emissions Directive (IED) set strict limits on industrial emissions, including those from copper production. Non-compliance with such regulations can lead to increased scrutiny, trade barriers, and the need for companies to invest in cleaner technologies. In response to evolving environmental standards, some copper producers have upgraded their smelting facilities with advanced sulfur capture systems and other emission control technologies. While such investments can be costly—sometimes exceeding hundreds of millions of dollars—they contribute to more sustainable production processes and help companies maintain access to regulated markets. This underscores the growing influence of environmental regulations on global trade, pushing industries to adopt cleaner technologies and improve their environmental footprints. As sustainability becomes a key factor in international commerce, compliance with stringent regulations is increasingly necessary for companies to remain competitive.

Copper Production & Trade



While standards and regulations are necessary for the protection of health and the environment, they present challenges for exporters, particularly small and medium-sized enterprises (SMEs) in developing countries. These businesses often lack the resources to meet stringent requirements, putting them at a disadvantage in global markets. However, these challenges also present opportunities. Exporters who invest in compliance and sustainable practices can gain access to premium markets, enhance their brand reputation, and attract environmentally conscious consumers. Furthermore, international efforts to harmonize standards, led by organizations like ISO and the World Trade Organization (WTO), can help reduce trade barriers, making it easier for businesses to navigate global markets.

Technical, sanitary, and safety standards play a crucial role in the trade of base metals. While these regulations help protect human health and the environment, they can also disrupt trade flows and increase costs for exporters. By investing in compliance and sustainability, businesses can adapt to these evolving regulations and capitalize on the growing demand for responsibly sourced metals. Moreover, international collaboration to harmonize standards can help reduce barriers to trade and promote fair competition, benefiting both exporters and global consumers. The International Nickel Study Group (INSG) (www.insg.org), International Lead and Zinc Study Group (ILZSG) (www.ilzsg.org), and International Copper Study Group (ICSG) (www.icsg.org) provide comprehensive insights into market trends, regulatory developments, and sustainability initiatives affecting the trade of nickel, lead, zinc, and copper. They have published important reports on health, safety, and environmental regulations in the base metals industry including: Environment, Health and Safety Regulations Relating to Nickel, Environment and Health Controls on Zinc and Environment and Health Controls on Lead, and Regulatory Affairs Affecting Copper. For the latest updates and full reports, readers can visit the official websites of the INSG, ILZSG, and ICSG.

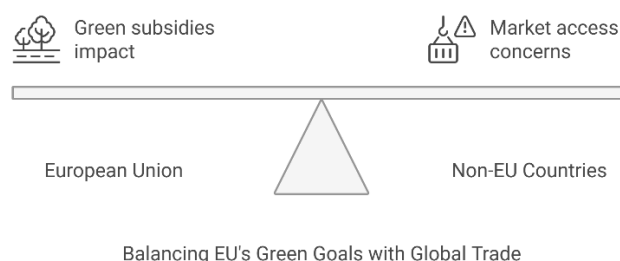
D. Subsidies – Financial aid to Domestic Industries

Subsidies are widely employed by governments to support domestic industries, especially in sectors like base metals, where global competition is intense. This financial aid often shields domestic producers from foreign competition and is used to ensure industry sustainability, job retention, and national economic security. However, such subsidies can distort international trade by creating imbalances, affecting global supply and demand dynamics, and triggering trade disputes. Government subsidies in the base metals sector can take many forms, each designed to support domestic industries, ensure supply chain security, or promote economic growth. Below is an overview of some of the subsidies used by the United States (US), European Union (EU), and China.

The U.S. government's support for its domestic base metals industry has significant implications for international trade. Measures such as accelerated depreciation and loan guarantees allow U.S. producers to lower their operational costs and remain competitive globally. In the U.S., mining companies can take advantage of accelerated depreciation on their capital investments. Section 179 of the U.S. Internal Revenue Code allows businesses to deduct the full purchase price of qualifying equipment and software purchased or financed during the tax year, rather than depreciating the asset over time. This provision is especially beneficial for capital-intensive industries, such as mining, as it provides immediate tax relief and improves cash flow. For the 2025 tax year, the maximum deduction was \$1,250,000, with a phase-out threshold beginning at \$3,130,000 in total qualifying purchases. The U.S. Department of Energy (DOE) provides loan guarantees for projects involving critical minerals and base metals. Through its Loan Programs Office (LPO), the DOE's Title 17 Clean Energy Financing Program offers financial support to projects that enhance domestic supply chains for these essential materials. This includes initiatives focused on the extraction, processing, and recycling of critical minerals such as lithium, cobalt, nickel, and rare earth elements. For instance, in January 2025, the DOE announced a \$996 million loan guarantee to Rhyolite Ridge LLC. This funding supports the development of a lithium-boron project in Nevada, aiming to produce lithium carbonate for electric vehicle batteries. Additionally, in November 2024, the DOE finalized a \$475 million loan to Li-Cycle Holdings. This investment facilitates the construction of a battery recycling facility in Rochester, New York, contributing to the domestic supply of critical materials for electric vehicle batteries. The EU and the U.S. have engaged in several WTO disputes involving subsidies and trade practices that indirectly

impacted the metals and mining sectors, though no case specifically targeted U.S. subsidies to the minerals and metals sector. In WTO Dispute DS108 (1997), the EU contested the U.S. Foreign Sales Corporation (FSC) tax regime, which provided tax breaks to U.S. exporters, including metals and mining companies, resulting in a WTO ruling against the U.S. and the eventual repeal of the FSC regime. Additionally, in WTO Dispute DS217 (2002), the EU and other countries challenged the U.S. Byrd Amendment, which distributed anti-dumping and countervailing duties to domestic industries, including metals producers, arguing it created an unfair advantage, leading to another WTO ruling against the U.S. and the repeal of the amendment. Beyond these cases, the EU has raised broader concerns about U.S. subsidies, such as tax incentives, loan guarantees, and energy subsidies, which could benefit mining and metals companies, including programs like the Defense Production Act (DPA) and Department of Energy (DOE) loan guarantees supporting critical minerals production, potentially distorting global markets.

In the European Union, subsidies are aimed at enhancing sustainability, technological innovation, and reducing reliance on external sources of critical metals. The Horizon 2020 research program is a major EU initiative that funds R&D in mining and materials processing. A notable project funded by this program is FAME (Flexible and Advanced Materials for Energy), which focuses on using copper and nickel-based materials in the production of energy-efficient batteries. Horizon 2020 also funded the MIN-GREEN project, aimed at improving the environmental sustainability of zinc and copper extraction in Europe by using cleaner extraction methods. In France, the 2024 Finance Bill introduced a tax credit for green industry, equal to 20% (or 25% to 40% depending on the geographic area of investment) of the amount of eligible expenses incurred. This tax credit could amount to a maximum of EUR 150 million per company (or EUR 200 million to EUR 350 million in the case of investments in specific areas). Eligible investment expenditures are incurred in connection with activities contributing to the production of batteries, solar panels, wind turbines, and heat pumps which are all using critical minerals and metals. The European Investment Bank (EIB) is providing €243 million to ERG Group, a leading renewable energy operator, to develop wind and solar energy projects in Italy, France, and Germany. This financing supports ERG's 2024-2026 Business Plan, which includes the construction of three onshore wind farms in France, repowering existing wind farms in Italy and Germany, and revamping solar plants in Italy. The total installed capacity will reach around 270 MW, enough to provide power to over 200,000 families. The project, which is located in EU cohesion regions, will bring significant local economic benefits. As part of the REPowerEU goals, the EIB offers favorable loan terms, covering up to 75% of project costs. ERG's transition from oil to 100% renewable energy supports its target of net-zero emissions by 2040. This transition will boost global demand for metals and minerals, particularly for components used in wind, solar, and battery technologies. The EU's green subsidies and internal reforms promoting sustainability have sparked trade disputes with countries like Russia, Kazakhstan, and South Africa. In 2018, Russia raised concerns within the WTO, claiming EU green subsidies for cleaner technologies and recycling created unfair competition and limited market access for its metal exports, such as nickel, copper, and aluminum. Kazakhstan similarly argued during 2015 negotiations that EU subsidies for green technologies in nickel and zinc production restricted access to European markets for raw material exporters. South Africa voiced concerns in trade talks, fearing that EU sustainability policies, including stricter emissions regulations, could result in trade barriers for its mining sector. These disputes highlight the tension between the EU's green transition and the interests of non-EU countries reliant on raw material exports. The EU's policies could disrupt global trade in minerals and base metals, as non-EU producers may face reduced market access, potentially affecting supply chains and prices.



China's subsidies in the base metals sector have often been a topic of significant contention. These subsidies, which include low-interest loans, tax rebates, discounted energy prices, and direct cash grants, have led to overcapacity, and an excess of base metals being exported at competitive prices. Producers in other regions, such as the US and EU, have faced challenges due to the lower prices of Chinese exports. For instance, in 2016, a global surplus in zinc—largely fueled by significant overproduction in China—resulted in a steep decline in market prices. This oversupply was attributed to China's aggressive expansion in zinc production capacity, which outpaced global demand, thereby saturating the market. The sharp drop in zinc prices had a pronounced impact on zinc smelters in the United States and European Union, where operations became economically unsustainable due to reduced profit margins. In response to these market pressures, China's leading zinc smelters committed to cutting their output by 500,000 tonnes, which represented nearly 10% of their total production. The US and EU have raised concerns through various trade mechanisms, including filing complaints with the World Trade Organization (WTO). These complaints assert that China's subsidies are distorting global trade by allowing Chinese producers to sell base metals at below-market prices. For example, in 2018, the US lodged a complaint regarding China's subsidies for copper and nickel production, arguing that these practices undermined global market stability. The EU has also addressed these concerns, particularly regarding nickel used in stainless steel production. In 2020, the EU imposed anti-dumping duties on Chinese stainless steel, which indirectly affected the nickel industry. These actions aim to create a more balanced competitive environment for producers outside of China. The imposition of tariffs and countermeasures has created a cycle of retaliatory actions between China and trade partners like the US and EU. In the context of the 2018 US-China trade war, the US implemented tariffs on various Chinese products, including base metals. In return, China applied tariffs on US exports such as copper scrap. These retaliatory actions have further impacted global trade patterns, especially in raw materials like copper scrap, where China was once a significant importer.



The global supply chain disruptions caused by the COVID-19 pandemic added another layer of complexity to the global trade dynamics in base metals. Both the US and EU have increasingly emphasized the need to reduce their dependence on Chinese metal imports, exploring options to strengthen domestic production capabilities. This shift could further alter trade patterns in the base metal industry. Additionally, the growing importance of nickel in the electric vehicle (EV) battery supply chain has raised concerns in the US and EU about reliance on Chinese nickel production. Both regions have initiated efforts to diversify sourcing, with investments in domestic nickel processing and sourcing from countries like Canada and Australia. The EU has also enacted stricter regulations to ensure that raw materials, including nickel, are sourced sustainably, indirectly affecting Chinese producers.

Subsidies in the base metal sector have had a significant impact on global trade. These subsidies have contributed to overproduction and market distortions, which in turn have affected pricing and competition for producers in the trade partners' countries and regions. Trade responses, including complaints to the WTO and the imposition of tariffs, have been used as a method to address these

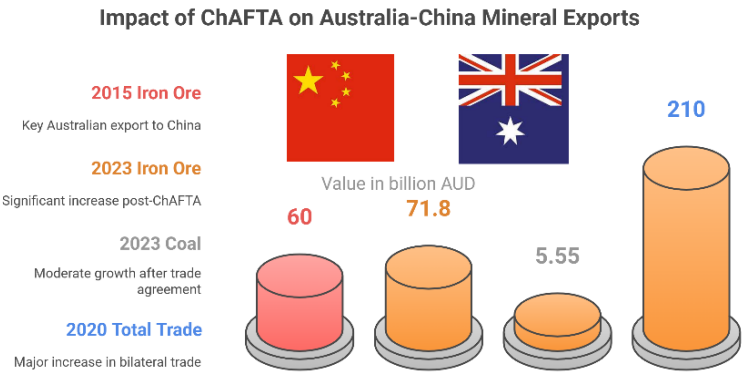
imbalances. While some progress has been made through regulatory actions and negotiations, challenges remain, particularly regarding the long-term sustainability of trade practices in the base metal sector. These developments reflect the complexities of global trade in commodities and the ongoing adjustments in response to shifting market dynamics.

3. Trade Agreement

Bilateral Agreements and Free Trade Agreement (FTA)

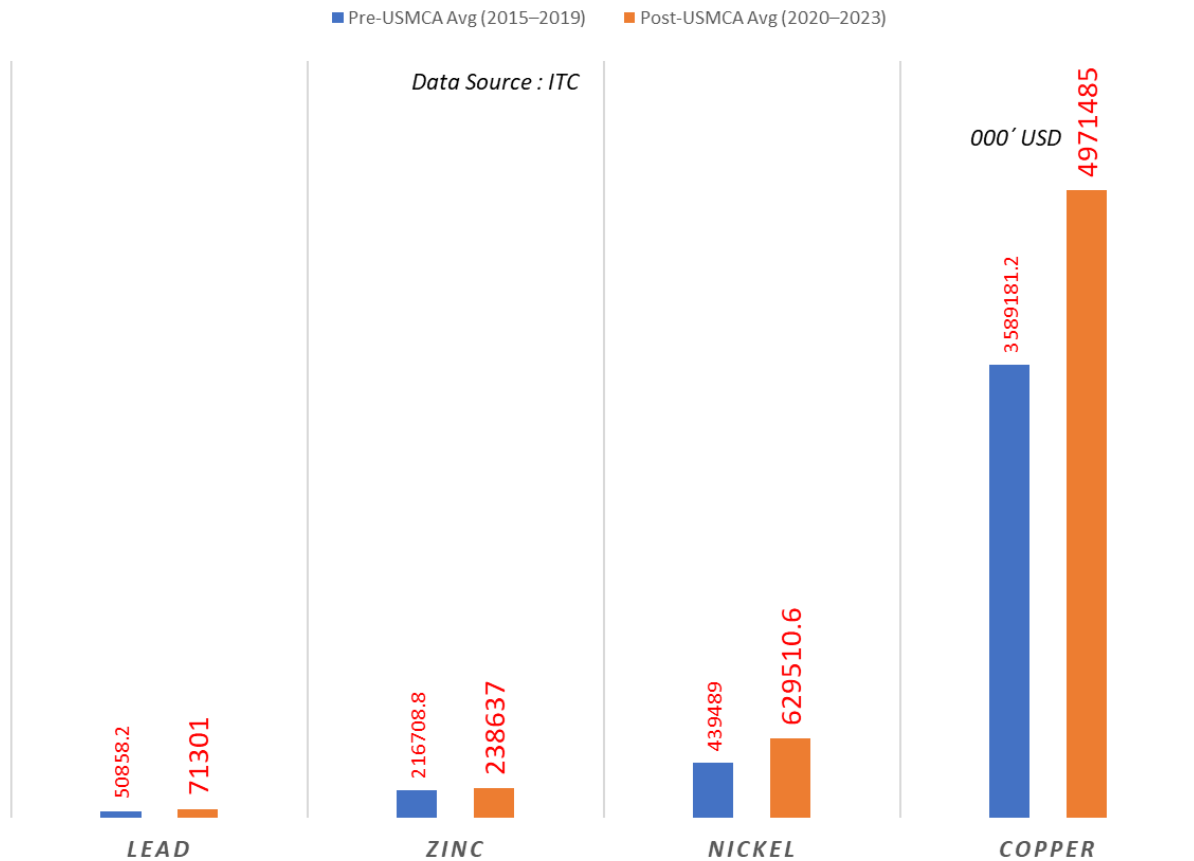
Bilateral trade agreements focused on minerals and base metals are key in ensuring the flow of raw materials between countries, fostering economic cooperation, and addressing demand-supply imbalances. These agreements can provide numerous advantages but also come with challenges.

The China-Australia Free Trade Agreement (ChAFTA) was reached in December 2015. Before the implementation of the ChAFTA, Australia's total mineral exports to China were valued at approximately AUD 60 billion annually, with key exports like iron ore and coal playing a significant role. By the time the agreement was implemented in 2016, the trade landscape changed dramatically. By 2020, total trade in goods between Australia and China reached AUD 210 billion, a substantial increase from previous years. The export value of iron ore surged to over AUD 71.8 billion in 2023, more than doubled the figure AUD33.3 in 2015. Coal export value also shot up to AUD 5.55 billion in 2023 from AUD 4.61 billion in 2015. These shifts highlight the profound impact of ChAFTA on boosting Australia's mineral exports to China, especially iron ore and coal.



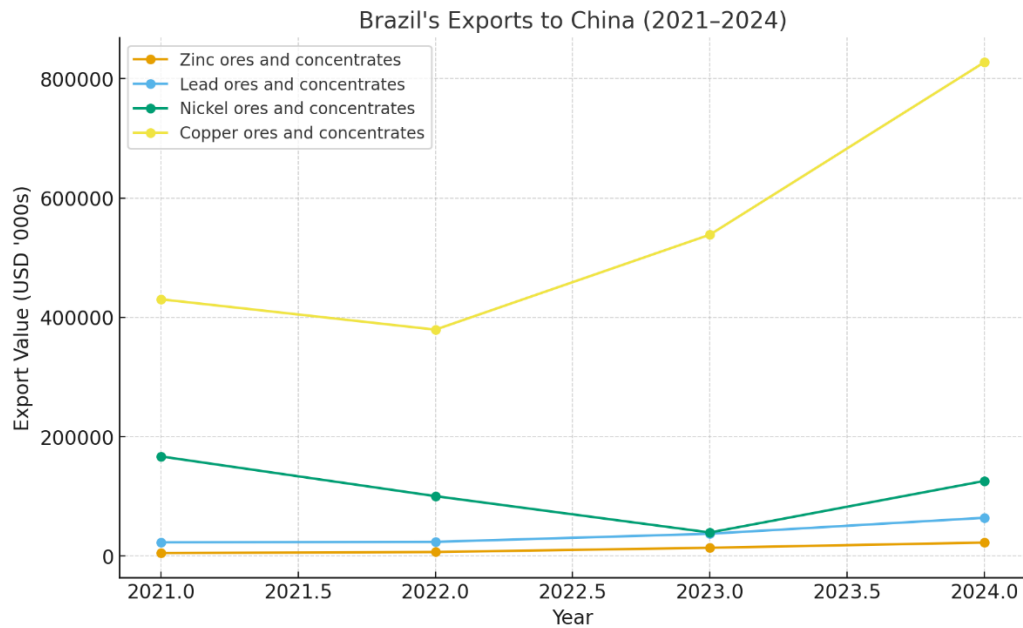
Since the USMCA came into effect in 2020, trade in minerals and metals between the United States, Canada, and Mexico has shown clear gains, with the strongest increases in copper (+23%) and nickel (+16%), reflecting rising demand from automotive, renewable energy, and electronics supply chains where USMCA's regional content rules encourage intra-bloc sourcing. Lead also recorded solid growth (+24%) despite its smaller trade base, while zinc remained nearly flat (+3%), highlighting more limited treaty effects or market volatility. In sum, the USMCA strengthened North American integration in key strategic metals, particularly copper and nickel, which now anchor regional supply chains under the new trade framework.

US EXPORTS TO CANADA AND MEXICO IMPACT OF USMCA (2020) ON TRADE IN METALS

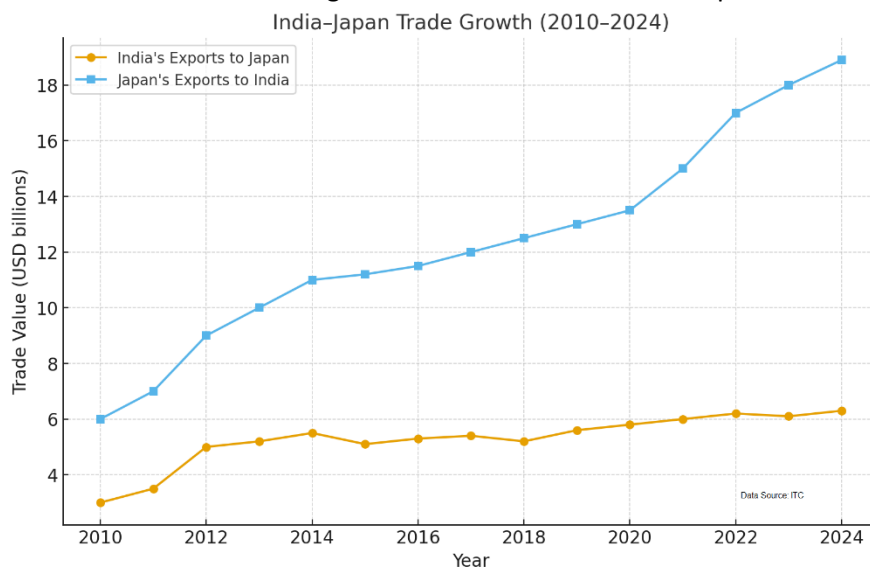


Over the past two decades or so, Brazil and China inked a slew of economic agreements to boost bilateral trade and investment. With the implementation of these agreements, the trade dynamics between the two countries changed significantly. By 2024, total trade from Brazil to China had surpassed USD 94 billion from mere USD 6.8 billion in 2005. Brazil's iron ore exports to China grew to around 277 million tonnes in 2024, the same figure was only 59 million tonnes in 2005. Iron ore ranks third following soybean and oil and petroleum oil in Brazil's total export to China in value. These changes underscore the importance of the Brazil-China agreement in expanding Brazil's mineral exports to China and fostering strong economic ties.

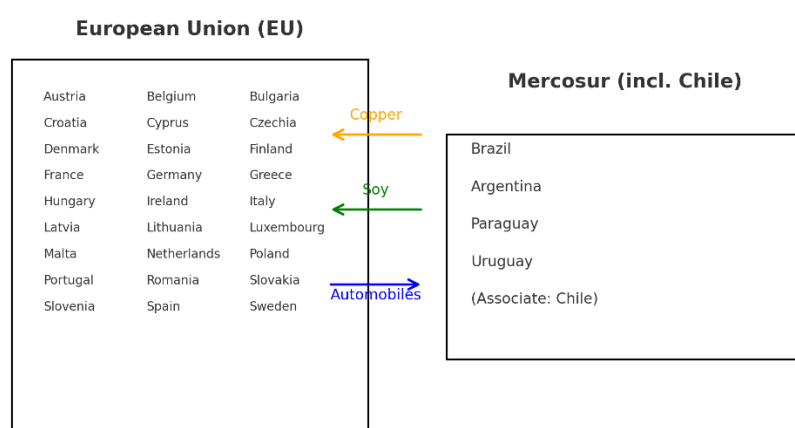
From 2021 to 2024, the value of Brazil's zinc ore shipments rose from USD5 million to more than USD22 million, while the value of lead ore exports surged nearly threefold, reaching over USD64 million. Nickel showed volatility, dropping from USD167 million in 2021 to 39 million in 2023, then rebounding strongly to USD126 million in 2024. The value of copper ore and concentrate climbed from USD430 million in 2021 to USD827 million highlighting its critical role in China's construction and electrification. While overshadowed by iron ore, these four metals illustrate Brazil's deepening role in supporting China's industrial supply chain diversification and clean-energy transition.



The India-Japan Comprehensive Economic Partnership Agreement (EPA) was agreed in August 2011. Before the India-Japan Economic Partnership Agreement (EPA), India's exports to Japan were valued at around USD2-4 billion annually. Following the implementation of the EPA in 2011, India's exports to Japan rose to the range of USD5-7 billion annually. On the other hand, Japan's exports to India shot up to USD17 billion in 2024 from mere USD6 billion in 2009. These increases in trade values demonstrate the positive effect of the EPA in enhancing the trade between India and Japan.



The EU-Mercosur agreement, which includes countries like Brazil, Argentina, and Chile, is a landmark trade deal between the European Union and the South American bloc. Taking into consideration Mercosur countries' rich mineral resources—such as Brazil's iron ore and bauxite, Argentina's lithium, and Chile's copper—the EU-Mercosur agreement has strategic importance beyond traditional agriculture and manufacturing. By cutting tariffs and harmonizing trade procedures, the deal should significantly lower the costs of exporting base metals and critical raw materials to the EU, which is actively seeking secure supply chains for its green and digital transitions. Coupled with the EU's existing €390 billion investment stock in Mercosur and its role as a leading foreign investor, the agreement is likely to channel more European FDI into mining, processing, and infrastructure. This would not only boost South America's mining sectors but also align with Europe's demand for sustainable access to raw materials essential for batteries, renewable energy, and advanced technologies.



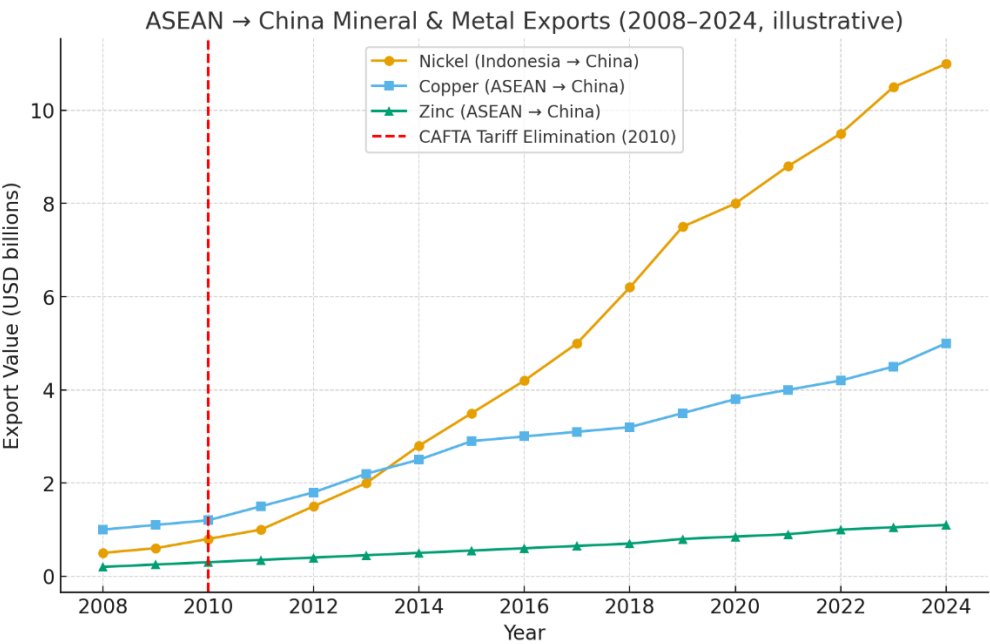
Illustrative EU-Mercosur trade flows

The India-Mercosur Free Trade Agreement has also bolstered trade. In 2009, when the agreement was ratified by the members, India’s exports to the Mercosur region stood as low at USD2 billion per annum, the same figure in 2024 was USD8 billion. Mercosur countries exports to India grew to USD11 billion from USD4 billion over the same period. The India–Mercosur PTA grants limited tariff preferences across selected lines, and minerals/metals are not broadly liberalized compared with other sectors. But the India-Mercosur PTA presents strong potential for minerals and metals trade. India’s rising demand for iron ore, copper, and critical minerals aligns with Mercosur’s resource richness—Brazil in iron ore and rare earths, Argentina in lithium, and Chile in copper. In Jan 2020, India approved an MoU with Brazil on cooperation in Geology and Mineral Resources—the core government-to-government framework for mineral collaboration. Since then, cooperation has moved from framework to project-level investment. Together with Argentina, India signed an MoU in January 2024 between the Mineral Exploration and Consultancy Ltd (MECL) and the provincial government of Catamarca to explore and mine five lithium blocks, marking a concrete step in securing lithium supplies. This was reinforced in 2025 through further joint statements and sectoral MoUs, broadening the scope to other critical minerals and value-chain partnerships. With Chile, India has pursued cooperation through the India-Chile Mining Industry Round Table (April 2025), which focused on copper, lithium, and sustainable mining practices, and is negotiating an expanded Comprehensive Economic Partnership Agreement (CEPA) to cover more mineral trade and investment lines.

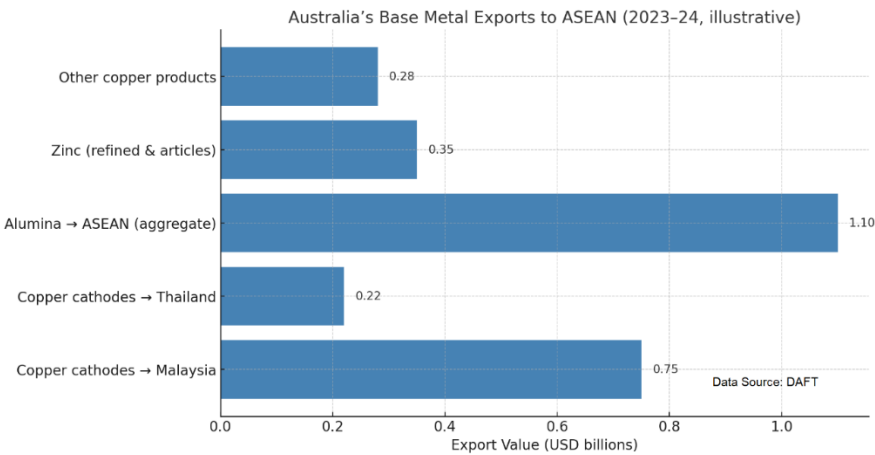


The China-ASEAN Free Trade Area (CAFTA) has had a significant impact on the trade of minerals and base metals between China and ASEAN countries such as Vietnam, Indonesia, and Malaysia. The China–ASEAN Free Trade Area (CAFTA), which eliminated tariffs on around 90% of product lines by 2010, has facilitated stronger mineral and metal flows between China and ASEAN. Under this framework, ASEAN suppliers such as Malaysia (US\$2.91 billion copper exports to China in 2024) and Vietnam (US\$153 million) gained improved copper access, while Indonesia emerged as China’s dominant nickel partner,

producing 2.3 million tonnes nickel ore in 2023 with over 90% of its smelters financed by Chinese firms. This integration attracted massive Chinese FDI—Indonesia alone received US\$94.1 billion since 2010, much of it in mining and refining.

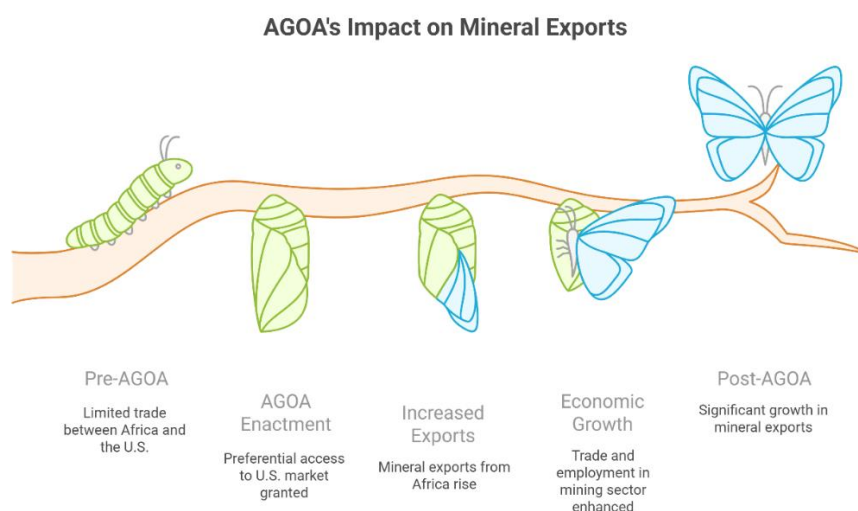


The ASEAN-Australia-New Zealand Free Trade Area (AANZFTA) has bolstered the trade of base metals between Australia, New Zealand, and ASEAN countries like Indonesia, Vietnam, and Thailand. Australia, a major exporter of aluminum, copper, and zinc, has benefited from enhanced market access in ASEAN countries, which are growing consumers of metals due to their booming manufacturing sectors. As of 2024, the AANZFTA agreement remains the cornerstone of Australia–ASEAN resource trade. The Second Protocol, issued in Nov 2024 and entering into force in 2025, strengthens Rules of Origin, customs, and trade facilitation, all vital for metals commerce. Under the baseline agreement, tariff preferences eliminate duties on 97.7% of Australian exports, giving its base metals strong market access. Recent trade data show that in 2023 Australia exported US\$0.75 billion of copper cathodes to Malaysia and US\$0.22 billion to Thailand, confirming ASEAN as a significant outlet for refined copper, while DFAT’s 2024 partner tables list copper ores/concentrates and alumina among top exports (see figure below). ASEAN as a bloc was among Australia’s largest trade partners in 2024, with resources trade showing sustained growth. On the investment side, the ASEAN Investment Report 2024 recorded US\$230 billion in ASEAN FDI inflows (2023), much of it into manufacturing and resource-processing sectors including Australian investment in mining and quarrying.



Since it was signed into law in May 2000, the African Growth and Opportunity Act (AGOA) has played a critical role in the United States' trade relationship with sub-Saharan Africa. The Africa Growth and Opportunity Act (AGOA) gives preferential access for eligible Sub-Saharan African countries to the U.S. market, including for copper. This act has facilitated increased mineral exports from countries such as Zambia, South Africa, and the Democratic Republic of Congo (DRC), which are major exporters of metals. AGOA has spurred economic growth by enhancing trade and creating employment in the mining

sector. For example, the value of minerals ores exports to the U.S. grew by 370% between 2005 and 2024, the value of copper exports to the U.S. jumped 45 times over the same period, and the value of lead exports surpassed USD116 million in 2024 from nearly nothing in 2005.

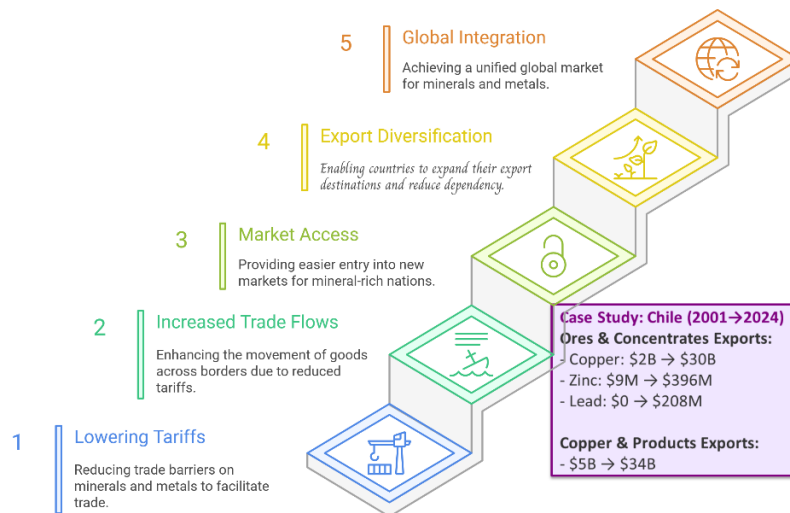


Each of these bilateral trade agreements/Free Trade Agreements has led to notable increases in both trade volumes and values. Whether through tariff reductions, better access to key markets, or strengthened economic ties, these agreements have had a significant impact on the trade of minerals and base metals, with substantial benefits for exporting countries.

Multilateral Agreements

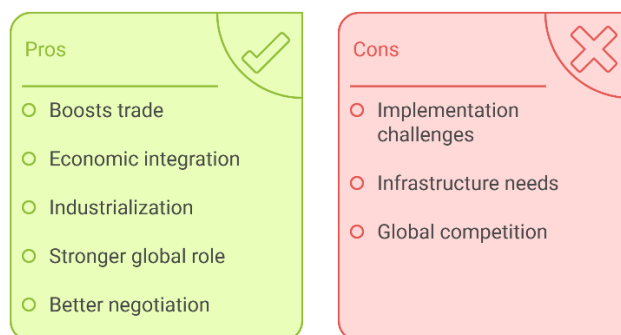
The World Trade Organization (WTO) through its General Agreement on Tariffs and Trade (GATT) framework, has played a pivotal role in reducing trade barriers for minerals and base metals. By lowering tariffs on commodities like copper, aluminum, and iron ore, the WTO has helped create a more competitive environment for international trade. This has led to increased trade flows, as countries can now access new markets more easily. For instance, countries like Chile, Peru, and Australia, with abundant copper reserves, have benefited significantly from easier market access, driving their mineral exports. A notable example of its benefits is the expansion of the base metal trade between Chile and the rest of the world. Chile's export value of copper ores and concentrate, zinc ores and concentrates, lead ore concentrates shot up to USD30 billion, USD396 million, and USD208 million respectively in 2024, the same figures in 2001 were USD2 billion, USD9 million, and zero in 2001. More impressive is Chile's copper and copper products exports which increased to USD34 billion in 2024 from USD5 billion in 2001. This case highlights how GATT has contributed to the global market integration of base metals, benefiting both exporting and importing countries. The agreement promotes global market integration, allowing mineral-rich nations to diversify their export destinations and reduce their dependency on individual markets. Furthermore, the WTO provides a dispute resolution mechanism which, though in paralysis for now, aims to promote stability and predictability in trade relations.

Achieving Global Market Integration



The African Continental Free Trade Area (AfCFTA) has the potential to boost the trade of minerals and base metals within Africa. By gradually eliminating tariffs and reducing trade barriers, it enables free movement of minerals and metals across the continent. The agreement encourages regional economic integration, providing a platform for African countries to increase intra-African trade, reduce reliance on individual markets, and enhance the continent's economic self-sufficiency. A major benefit is AfCFTA's push for industrialization by encouraging countries to add value to raw minerals — for example, processing and refining metals domestically before exporting. This fosters economic diversification and job creation. The agreement also promotes regional cooperation and shared infrastructure projects, which can improve transport networks essential for mining and trade. Beyond Africa, AfCFTA has the potential to strengthen the continent's role in global supply chains for critical minerals such as copper, cobalt, manganese, and lithium. By harmonizing standards and consolidating a larger unified market, African countries will be able to negotiate from a stronger position, attract foreign investment, and secure better terms when exporting to major partners like the EU, U.S., China, and India. This should reduce transaction costs, increase competitiveness, and enhance Africa's bargaining power in the global market for metals vital to green energy and high-tech industries.

AfCFTA's Impact on Minerals



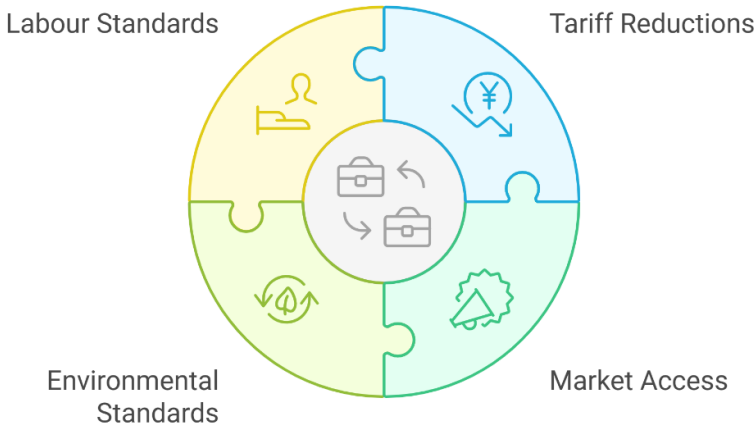
The Asia-Pacific Economic Cooperation (APEC) has established a Mining Working Group under its economic and technical cooperation framework to foster collaboration on minerals and base metals across the Pacific Rim, including major producers such as China, Japan, and Australia. The forum's discussions emphasize investment facilitation, regulatory cooperation, and the promotion of sustainable and well-regulated mining practices. A key focus has been the exchange of experiences and best practices, especially in areas such as environmental responsibility, safety, and the role of minerals in supporting the global energy transition. APEC member economies account for roughly 70 % of global

mining output, including copper, aluminum, iron ore, and nickel. The forum has highlighted the importance of these minerals for industrial development and for new technologies such as renewable energy and electric vehicles. While APEC does not impose binding trade rules, it provides a platform for economies to share policy approaches and support investment flows in mining and processing.



The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a wide-ranging trade agreement involving 11 economies across the Pacific Rim, including Australia, Canada, Chile, and Japan. Its central aim is to reduce tariffs, promote trade liberalization, and facilitate investment across diverse sectors, including minerals and base metals. For mineral-rich economies such as Australia, Chile, and Canada, the CPTPP has expanded access to key markets. Tariff reductions have lowered barriers for exports of ores and metals such as copper, iron, and nickel, making these goods more competitive in importing countries like Japan. Canada, for example, already exported billions of dollars' worth of metals and minerals to Japan prior to CPTPP, and the agreement further enhanced market access by eliminating tariffs on these exports. Canadian producers in sectors such as aluminum and copper benefited from improved certainty and a level playing field compared with non-CPTPP exporters. Beyond tariff liberalization, CPTPP includes provisions on environmental and labour standards, aiming to encourage sustainable resource management. These chapters provide a framework for promoting environmentally responsible mining and resource use, although enforcement remains limited.

CPTPP's Impact on Trade and Sustainability



Multilateral agreements such as the WTO, AfCFTA, APEC, and CPTPP have all played crucial roles in shaping the global trade flows of minerals and base metals. They have helped reduce trade barriers, promoted investment, and encouraged the liberalization of trade, leading to increased trade volumes and greater market access. However, these agreements face significant challenges, such as uneven distribution of benefits, infrastructure gaps, and the potential for unsustainable mining practices. While they have provided opportunities for economic growth and development, particularly in developing countries, the lack of strong environmental standards and enforcement mechanisms remains a concern. Balancing trade liberalization with responsible resource extraction and environmental protection will be key to ensuring that these agreements continue to deliver long-term benefits for all involved.

Preferential Trade Agreements (PTAs)

The European Union's Generalised System of Preferences (GSP) is a scheme under which many developing countries receive reduced or zero tariffs on certain goods exported to the EU. It aims to help developing economies increase market access, diversify exports, and foster economic growth. Mineral and base metal products are part of the export portfolio of many GSP beneficiary countries. For example, South Africa exports a substantial share of its fuel and mining-based products to the EU. GSP and other preferential trade instruments, combined with tariff reductions under trade cooperation agreements, help make some of those exports more competitive. The ITC data suggested the export value of mineral ores from South Africa to the EU market increased to USD2-4 billion level from below USD1 billion prior to 2005.

4. Export-Import Policies

A. Export Incentives

Export incentive policies are designed to encourage the export of goods, including minerals and metals, by making them more competitive in the global market. Prominent export incentive policies that can be applied to boost the exports include Duty Drawback Schemes, Export Subsidies, Export Credit Guarantees/Export Financing, Special Economic Zones (SEZs)/Export Processing Zones (EPZs), Market Development Assistance, Currency Devaluation, etc.

Duty Drawback Schemes allow exporters to claim a refund on the customs duties paid on imported inputs used in the production of exported goods. Under India's Duty Drawback Scheme, exporters can claim refunds on customs duties of up to 98% paid on imported goods that are re-exported in the same form within 2 years, for instance, a trader imports copper sheets, but re-exports them unused. Or refund of duty on inputs used in manufacturing exported goods based on the rate notified by Central Board of Indirect Taxes and Customs (CBIC) annually, for instance, copper concentrate imported, refined, then exported as copper cathodes. In 2023, the rates for iron and steel products ranged between 1-1.5%, copper products 1.2-2.2%, nickel 0.15%, aluminium 1-1.7%, lead 1.2-2.4%, zinc 1.2%, miscellaneous articles of base metals 1.4-2.2%.

Duty Drawback Scheme Examples

Scheme Type	Description	Example
 Re-export of Goods	Refund on duties for re-exported imported goods.	Trader imports copper sheets, then re-exports them unused
 Manufacturing of Exported Goods	Refund on duties for imported inputs used in manufacturing.	Copper concentrate imported, refined, then exported as copper cathodes
 2023 Rates (Examples)	Duty drawback rates for specific metal products in 2023.	Iron and steel products: 1-1.5%
 2023 Rates (Examples)	Duty drawback rates for specific metal products in 2023.	Copper products: 1.2-2.2%
 2023 Rates (Examples)	Duty drawback rates for specific metal products in 2023.	Aluminium: 1-1.7%
 2023 Rates (Examples)	Duty drawback rates for specific metal products in 2023.	Lead: 1.2-2.4%
 2023 Rates (Examples)	Duty drawback rates for specific metal products in 2023.	Zinc: 1.2%
 2023 Rates (Examples)	Duty drawback rates for specific metal products in 2023.	Miscellaneous articles of base metals: 1.4-2.2%

Export subsidies directly lower exporters' costs and distort competition by making subsidized goods artificially cheaper in global markets. This effect is well illustrated in the minerals and metals sector. In *United States v. India (DS541)*, a WTO panel ruled in 2019 that India's export-contingent schemes—including the Merchandise Exports from India Scheme (MEIS), Special Economic Zone (SEZ) incentives, and the Export Promotion Capital Goods (EPCG) scheme—were prohibited export subsidies because they granted duty credits or exemptions only when goods were exported. These programs covered a wide range of products, including base metals (HS 72–76). [Under the WTO case DS541: India – Export Related Measures, the U.S. claimed India was giving export incentives/subsidies under schemes \(MEIS, SEZ, EPCG, etc.\) “totaling over US\\$ 7 billion annually.”](#)

Export Subsidies and Market Distortion



Export credit guarantees and export financing are key tools used by governments (via ECAs – Export Credit Agencies) to reduce financial risk for exporters, especially in emerging markets or risky sectors. These instruments include loan guarantees, direct loans, credit insurance, and buyer credit, which help with cash flow, risk of non-payment, and access to capital. Empirical studies show these tools increase export volumes, enable entry into riskier markets, ease financing constraints, and allow exporters to offer more flexible payment terms.

Export Credit & Financing in Metals: India vs. China vs. EU (Germany)

Country	Main Institutions	Mechanisms / Policies	Metals & Minerals Examples	Impact / Trade Outcomes
India	ECGC, Exim Bank of India	• Export credit insurance (ECGC) • Buyer's Credit under NEIA (Exim + ECGC) • Lines of Credit (LOCs)	• ECGC insures iron & steel, aluminium, copper (~31% of ECGC cover in 2021–22) • Exim finances steel structural works, ferro-chrome plant equipment	• Backed ~US\$130 bn engineering exports (2022–23) • Reduced risk, supported deferred payments in risky markets
China	China Exim Bank, Sinosure	• Export Buyer's Credit Program (Exim) • Export credit insurance (Sinosure) • Concessional loans bundled with projects	• Steel exports tied to African & SE Asian infrastructure projects • Aluminium extrusions: U.S. CVD cases (buyer's credit subsidy) • Rare earths exports insured despite risk	• US\$629 bn exports insured by Sinosure in 2019 (large share metals) • Boosted penetration; triggered U.S. CVD duties & WTO disputes
Germany (EU)	Euler Hermes (Hermes Cover), backed by gov't	• Export credit guarantees (commercial + political risk) • Long-term export finance (with KfW/IPEX)	• Covers industrial machinery, steel equipment, metallurgical plant • 2005: Hermes guarantees ~€19.77 bn exports	• Supported German steel/engineering firms abroad • Hermes cover = ~2.5% of total German exports that year

Special Economic Zones (SEZs) and Export Processing Zones (EPZs) help mineral and base metal exporters by offering incentives like duty-free imports, reduced export duties, tax breaks, and streamlined regulations. These zones often have superior infrastructure (ports, power, transport), which lowers logistics costs. They attract Foreign Direct Investment (FDI), facilitate beneficiation of raw materials, and improve skills/technology transfer. In minerals-rich countries, SEZs/IDZs (Industrial

Development Zones) have been used to add value locally (smelting, refining) and increase export volumes of base metals.

SEZs/EPZs in Minerals & Metals – Comparative Examples

Country / Zone	Focus Metals & Activities	Export Metrics / Impact	Source
India – Kandla SEZ (Gujarat)	Minerals & engineering goods, metals handling	US\$ 38B exports in Dec 2022; includes metals/minerals	India-Briefing
India – Vizag SEZ (Visakhapatnam)	Aluminium exports (Pioneer Aluminium, Hindalco)	US\$ 48.4M aluminium exports via Vizag Port	ExportGenius
South Africa – Richards Bay IDZ	Aluminium, iron ore, ferroalloys, titanium	Raw Aluminium ZAR 25.3B; Chromium Ore ZAR 20B; Ferroalloys ZAR 19.5B	OEC
Mozambique – Beluluane IFZ	Aluminium smelting (Mozal, 580k t/y) + cables	US\$ 1.3B exports (2021), ~24% of total exports	Beluluane/IMF
Oman – Sohar Freezone	Iron ore pelletizing (Vale project)	2.0 Mt pellets Q1 2025 (+15% YoY); exports to MENA & Asia	Argus Media
China – Baotou Rare Earth Zone	Rare earth refining & magnets	55,431 t rare earth exports (2024, post-2014 high)	Reuters

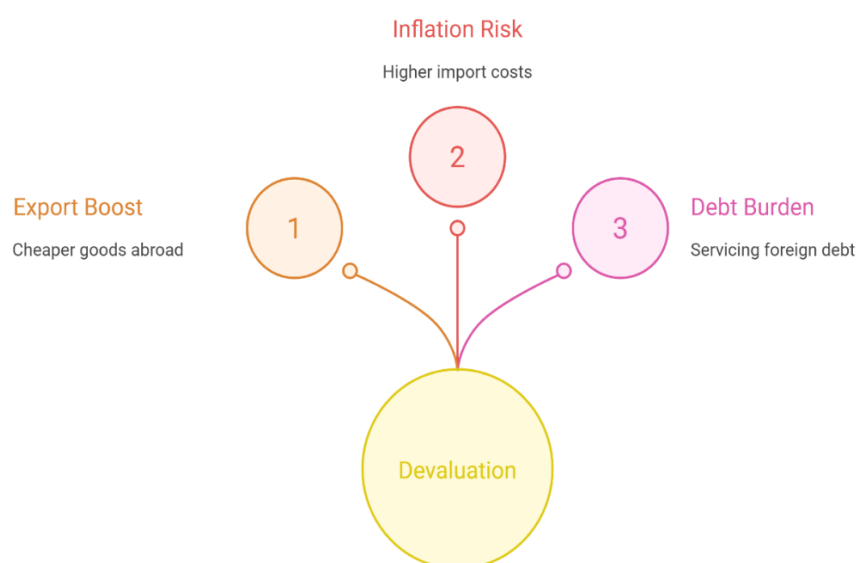
Market Development Assistance (MDA) activities play a vital role in boosting exports by helping businesses navigate international markets and overcome barriers to success. These activities include providing export market research and analysis to help businesses understand market demand, competition, and regulations, enabling informed decision-making. Trade missions and business delegations offer direct engagement with international buyers, while participation in trade fairs and exhibitions enhances brand visibility and facilitates networking opportunities. Export training programs improve businesses' knowledge of market entry strategies, logistics, and international regulations. MDA also includes branding and promotion support, helping businesses develop effective marketing strategies to enhance their international appeal, and customized market entry strategies that guide businesses through selecting distribution channels and local partnerships. Networking opportunities, such as international conferences or forums, help businesses expand their connections and expose them to new opportunities. These MDA activities collectively enable businesses to improve competitiveness, expand their global reach, and ultimately increase their export success.

Market Development Assistance (MDA) Programs

Country	Program	Mechanisms	Evidence/Impact	Source
India	MDA & MAI Schemes	Trade fairs, missions, branding, surveys	MSMEs ≤₹15cr exports; institutional branding & studies	Govt of India
UK	Tradeshow Programme (TAP)	Grants for exhibiting at trade shows	BCR ~5.1x; £57.1m benefits vs £11.2m cost; 59% manufacturing firms	London Economics eval
USA	STEP	Missions, fairs, training, intl marketing	FY21: 7,400 SMEs, US\$1.5bn export sales	SBA Annual Report
Australia	EMDG	Export promotion, fairs, digital, training	50k SMEs supported since 1974; higher survival & turnover growth	Austrade OCE
Brazil	ApexBrasil	Research, fairs, missions, branding	2022: 13k firms supported; US\$89.2bn exports	ApexBrasil Report
EU	Access2Markets, EEN	Market intel, partner search, events	EEN: 600 orgs, 2.6m SMEs supported since 2008	European Commission
China	CCPIT	Canton Fair, trade missions, B2B	2023 Autumn Fair: 189k buyers; US\$22.3bn export deals	CCPIT/China Daily

Currency devaluation is often used as a strategy to boost exports by making a country's goods and services cheaper on the international market, increasing demand from foreign buyers. Currency devaluation can provide short-term relief for mineral and metal exporters by making their goods cheaper in foreign markets, but the benefits are uneven and often offset by rising import costs. In Brazil, for example, the sharp depreciation of the real in 2015 helped boost commodity export volumes, with the International Monetary Fund noting that net exports began to support growth as foreign sales expanded and imports contracted (“Brazil: Staff Report for the 2016 Article IV Consultation”). Similarly, in South Africa, the weakening of the rand during the mid-2010s gave mining exporters, particularly in gold, higher revenues in local currency terms, though this advantage was tempered by higher costs of imported machinery and energy, alongside low global commodity prices (Budget Review 2016; SA Mine 8th Edition). In Zambia, a significant depreciation of the kwacha in recent years increased local currency earnings for copper exporters, but it also amplified the burden of servicing foreign-denominated debt and raised the cost of imported inputs, feeding into domestic inflation (Zambia Country Focus Report). These cases illustrate how devaluation can bolster export competitiveness in minerals and metals, yet they also highlight the risks of inflation, higher debt costs, and limited long-term gains when structural challenges remain.

Currency Devaluation Impacts Mineral Exports



B. Export Control

Governments often use export controls on minerals and metals—such as export bans, licensing requirements, or tariffs—to protect strategic industries or to gain more value from raw exports. For example, Indonesia banned nickel ore exports in 2020, which led to a surge in downstream processing and raised the value of its nickel product exports from about USD 4 billion in 2017 to USD 34 billion in 2022 according to Center for Research on Energy and Clean Air. In April 2025, China introduced export licensing restrictions on seven medium and heavy rare earths and magnets, citing their importance in defense and high-tech supply chains. While such controls can boost domestic industry and improve terms of trade, they often lead to trade tensions, supply chain disruption, and higher costs for importing countries.

Export Controls on Minerals & Metals

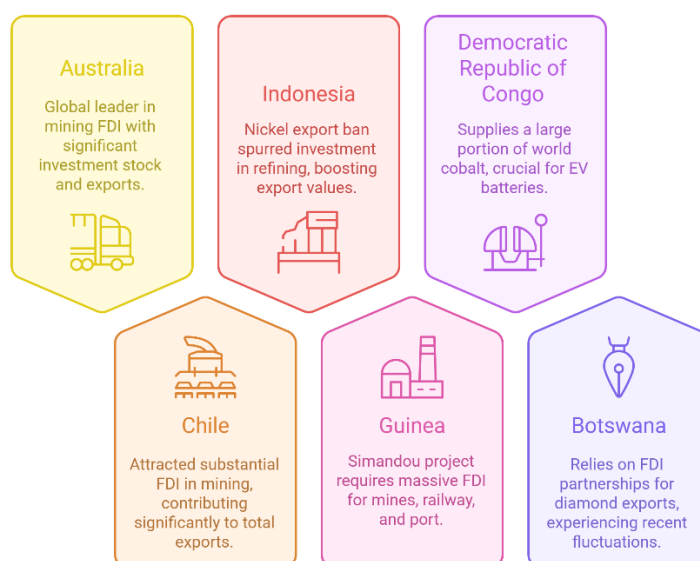
Country	Mineral/Metal	Control Type	Impact	Source
Indonesia	Nickel ore	Ban on raw ore exports (2020) to promote domestic processing	Nickel exports rose from US\$4B (2017) to US\$34B (2022); >60 smelters built	IEA/CREA
China	Rare earths & magnets	Export licensing requirements (2025) on 7 REEs & magnets	2024 exports: 58,142 t worth US\$2.9B; restrictions disrupted EU/US supply	CSIS/China Briefing
DRC	Cobalt	Export ban / suspension (2025)	CMOC cobalt output up 13% (61,073 t H1 2025) but exports restricted; price volatility rose	Ecofin Agency
United States	Critical minerals	Targeted export controls & tariffs (ECRA, Sec. 232)	Incentivized domestic mining/processing; DoD funding e.g., Lynas USA rare earth facility	CFR

5. Investment and Trade Facilitation

A. FDI Rules

Foreign Direct Investment (FDI) is a cornerstone of the global minerals and metals trade, supplying capital, expertise, and technology that expands exploration, production, and downstream processing. Australia is a global leader in mining FDI. In 2024, foreign investment stock in mining and quarrying reached A\$407.7 billion (≈US\$267 billion), with mining exports valued at A\$467 billion in 2023–24 (DFAT, 2024; Discovery Alert, 2025). Chile attracted US\$15.3 billion in FDI in 2024, of which 26.8% went to mining (InvestChile, 2024). Copper exports totaled about US\$50 billion, nearly half of Chile’s total exports (Andaman Partners, 2025). Major companies, including BHP and Rio Tinto, continue to expand operations—BHP committed US\$2 billion at Escondida in 2025 as part of a US\$10.8 billion plan (Reuters, 2025). Chile’s mining pipeline for 2023–2032 includes US\$65.7 billion in projects, highlighting sustained foreign interest (Expomin, 2025). Indonesia’s 2020 ban on unprocessed nickel ore exports spurred investment in refining. Nickel export values jumped from US\$4 billion in 2017 to US\$34 billion in 2022, and stabilized at around US\$33.6 billion in 2024 (CREA, 2023; Xinhua, 2025). Total FDI inflows reached US\$55.3 billion in 2024, with US\$7.8 billion directed to basic metals in the first half (ASEAN Briefing, 2024). Elsewhere, FDI finances major infrastructure: Guinea’s Simandou project (≈2.4 billion tonnes of 65% Fe ore) requires US\$15–20 billion for mines, a railway, and a port (Hogan Lovells, 2024). The Democratic Republic of Congo supplies 74% of world cobalt output, underpinning EV battery supply chains (Cobalt Institute, 2022). Botswana relies on FDI partnerships like Debswana; diamond exports were US\$3.63 billion in 2023, before dropping to US\$1.95 billion in 2024 (Import Globals, 2025).

FDI in Mining

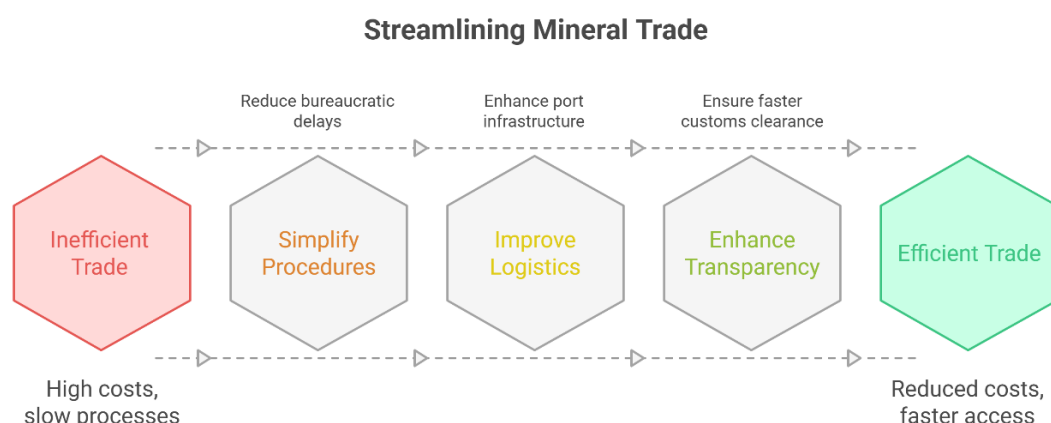


B. Trade Facilitation

Trade facilitation plays a critical role in streamlining customs procedures and reducing the costs associated with the international trade of minerals and base metals. Efficient trade facilitation initiatives, such as simplifying customs procedures, improving logistics, and enhancing port infrastructure, directly impact the cost-effectiveness and speed of transporting bulk commodities such as metals and minerals. By reducing bureaucratic delays, improving transparency, and ensuring faster customs clearance, trade facilitation enables miners and exporters to access global markets more efficiently, ultimately reducing transaction costs and enhancing trade competitiveness.

The WTO’s Trade Facilitation Agreement (in force since 2017) is projected to reduce global trade costs

by about 14.3% and add US\$1 trillion to trade annually, with studies showing that a 10% increase in customs delays can cut exports by nearly 4% (WTO, 2017; WTO, 2023). Evidence from key mineral exporters illustrates these impacts: Peru’s 2023 Time Release Study at El Callao port revealed average clearance times exceeding 167 hours, establishing a baseline for copper export reforms (WCO, 2023); Chile’s SICEX single-window system reduces duplicated paperwork and digitizes export processes, streamlining copper shipments (WTO, 2023); in Central Africa, a 2024 WCO project at Kasumbalesa seeks to eliminate chronic border delays affecting cobalt and copper exports from the DRC to Zambia (WCO, 2024); Kazakhstan’s Belt and Road Initiative (BRI) corridors are estimated to reduce shipment times by 4.4–8.3% and trade costs by 2.5–4%, benefiting copper and ferro-alloy exports to China (World Bank, 2020); and Mexico’s Port of Lázaro Cárdenas, where mineral bulk made up 44% of the 2.46 million tons handled in 2022, is expanding with a US\$27 million upgrade to lower handling costs for iron ore and copper (Mexico News Daily, 2022; BNAmericas, 2022). Collectively, these initiatives demonstrate how modern trade facilitation enhances efficiency, reduces uncertainty, and strengthens the competitiveness of mineral-rich economies in global markets.



6. Intellectual Property Rights (IPR)

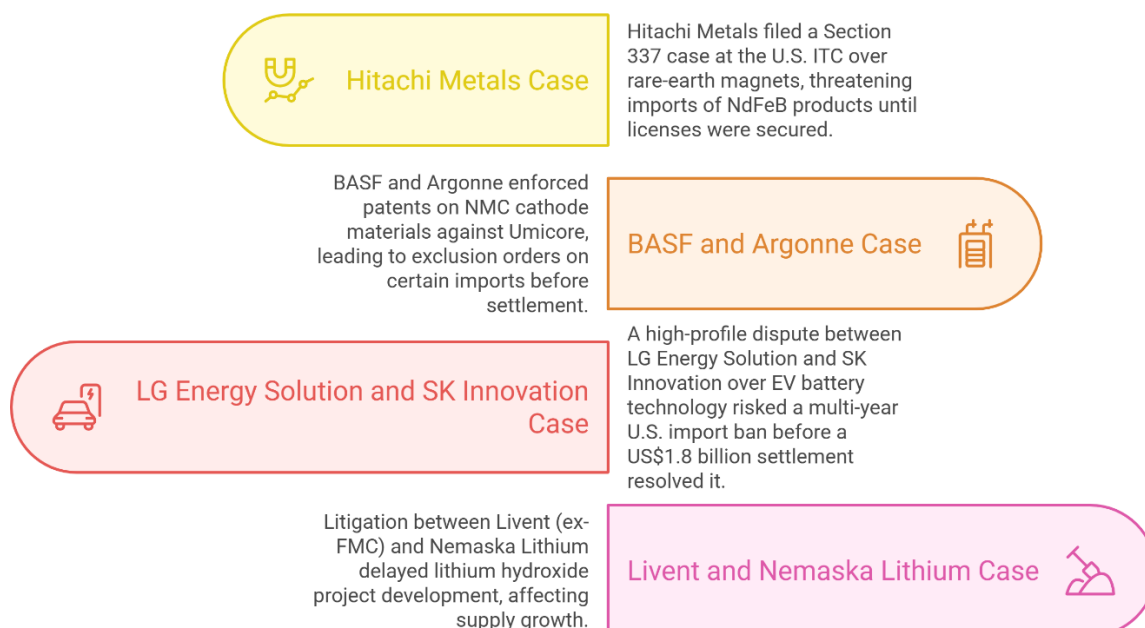
Intellectual property rights (IPR) enhance international trade in minerals and metals by protecting technological innovation, lowering costs, and improving competitiveness. Mining OEMs like Caterpillar and Komatsu patent autonomous haulage and control systems that raise productivity and safety in large mines, helping scale mineral output for export (Caterpillar, 2023; Komatsu, 2023). Tata Steel reported 588 granted patents in 2023–24, supporting premium steel products that compete in export markets (Tata Steel, 2024). In rare earths, Lynas holds patents on processing technologies such as US-11,447,397 B1, enabling supply to high-tech markets like Japan (USPTO, 2022). Barrick Gold, with CSIRO, patented thiosulfate leaching as a cyanide alternative, aligning gold exports with environmental standards (CSIRO, 2020). Strategic supply partnerships such as Tesla–BHP’s nickel deal also rely on proprietary systems for sustainability and traceability in EV metals trade (BHP, 2021). By safeguarding these innovations, IPR incentivizes R&D, attracts investment, and ensures that minerals and metals are produced more efficiently and sustainably, directly expanding export opportunities and strengthening global trade flows.

Enhancing Mineral Trade with IPR



Intellectual property disputes disrupt trade in minerals and metals too. In 2012, Hitachi Metals filed a Section 337 case at the U.S. ITC over rare-earth magnets, threatening imports of NdFeB products until licenses were secured (ITC, 2012). Similarly, BASF and Argonne enforced patents on NMC cathode materials against Umicore, leading to exclusion orders on certain imports before settlement (ITC, 2017). In 2021, a high-profile dispute between LG Energy Solution and SK Innovation over EV battery technology risked a multi-year U.S. import ban before a US\$1.8 billion settlement resolved it (Reuters, 2021). Earlier, litigation between Livent (ex-FMC) and Nemaska Lithium delayed lithium hydroxide project development, affecting supply growth (Financial Post, 2019). These cases show how IPR conflicts—via exclusion orders, licensing disputes, or project delays—can directly or indirectly constrain the international trade of rare earths, lithium, cobalt, nickel, and steel-related materials, raising costs and creating uncertainty in global supply chains.

Intellectual Property Disputes



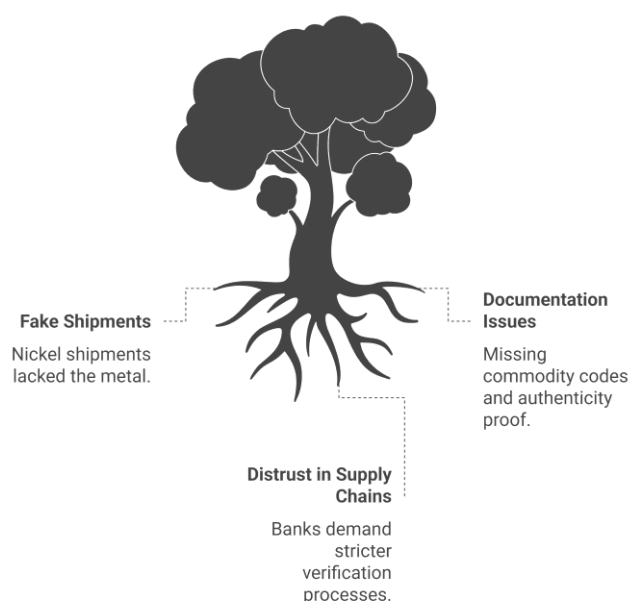
7. Trade Remedies

A. Anti-counterfeiting

Anti-counterfeiting measures are crucial in the minerals and metals trade to combat counterfeit goods, which can undermine product quality, safety, and market integrity. These measures help protect the reputation of companies and the interests of consumers by ensuring that the minerals and metals in

question are genuine and meet the required standards. In 2023, commodity trader Trafigura revealed a loss of about US\$577 million after discovering that shipments it bought from companies linked to Indian businessman Prateek Gupta, supposedly containing nickel, in fact lacked the metal—documents showed missing or incorrect commodity codes and no proof of authenticity (Reuters 2023). The scandal, one of the largest frauds in metals trading, shook trust in nickel supply chains, leading banks and counterparties to demand stricter verification, third-party assays, and additional paperwork, which increased costs and slowed trade flows. While the incident did not create a sustained global nickel shortage, it undermined confidence in parts of India’s metals export sector and encouraged buyers to shift sourcing toward jurisdictions with stronger reputations for transparency such as Australia or Canada (Public Eye, 2023). As a result, the case illustrates how fraudulent practices in bulk commodities can distort international trade flows by raising transaction costs, discouraging smaller traders, and pressuring the industry toward tighter regulation and supply-chain traceability.

Nickel Trade Disruption due to Fraudulent Practices

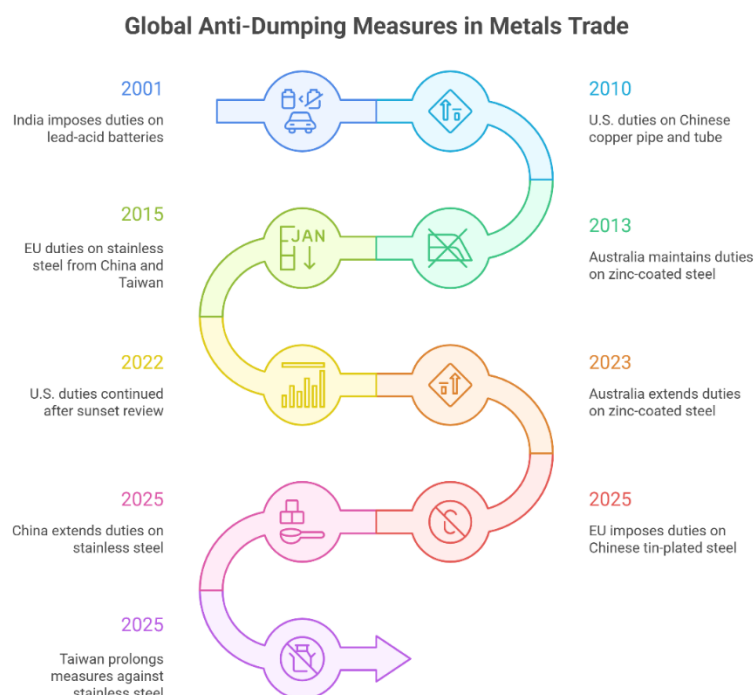


B. Anti-dumping Measures

Notable cases involving lead, zinc, nickel, and copper where anti-dumping measures have been applied in international trade. These metals are critical components in various industries, including construction, electronics, and automotive manufacturing, making the trade of these commodities subject to regulatory scrutiny.

In the United States, duties of up to 60.85% were imposed in 2010 on Chinese copper pipe and tube (24.89–27.16% for Mexico), and these measures were continued in 2022 after a sunset review, reducing low-priced imports and supporting producers like Mueller (Federal Register, 2010; 2022). In the European Union, stainless steel cold-rolled flat products (nickel-bearing) from China and Taiwan have been subject to anti-dumping duties since 2015 (up to 25.3%), later extended in 2021 and amended again in 2025, stabilizing EU producers such as Outokumpu and Aperam (EU Reg. 2015/1429; 2021/1483; 2025/1573). Australia has maintained duties on zinc-coated steel from China since 2013, with extensions as recently as 2023, safeguarding firms like BlueScope and zinc upstream suppliers (ADC, 2023). In India, duties on lead-acid batteries (2001) from China, Korea, and others were rolled back for Bangladesh in 2004–05 following WTO dispute DS306, showing how AD measures can be reversed (WTO DS306, 2005). More recently, in Japan (2025), an investigation was launched into nickel-based stainless CR steel from China and Taiwan, with alleged undercutting of 20–50% (China) and 3–20% (Taiwan). The U.S. (2024–25) opened probes on corrosion-resistant steel (CORE) from 10 countries, citing dumping margins up to 195%. The EU (May 2025) imposed final duties of 13%–62% on Chinese tin-plated flat steel, while China (2025) extended its own AD duties (20.2%–103.1%) on stainless billet

and plate from the EU, UK, South Korea, and Indonesia. Taiwan (2025) prolonged its measures against Chinese and South Korean stainless steel (38%). Together, these cases show that while anti-dumping actions protect domestic markets from unfair pricing, they also shift global trade routes, alter sourcing patterns, and add volatility to pricing in critical industrial metals.



C. Countervailing Duties

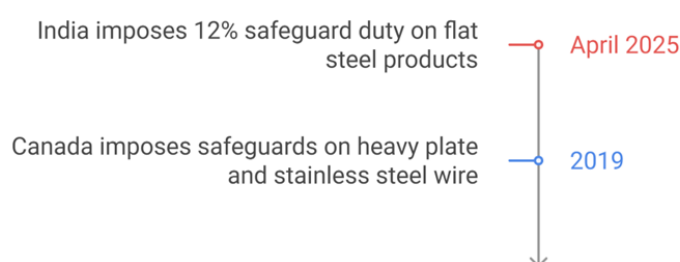
Countervailing duties (CVD) are imposed by governments to offset subsidies provided by foreign governments to their domestic industries, which result in unfair trade advantages. In the context of minerals and metals like nickel, lead, zinc, and copper, countervailing duties are often used to protect domestic producers from subsidized imports that could undercut local prices. Below are the most recent and prominent real-life instances that illustrate the application of countervailing duties in the trade of these metals.

D. Safeguard Measures

Safeguard measures are temporary trade barriers that governments impose to protect local industries from an unexpected surge in imports, which can cause or threaten to cause serious injury to domestic producers. These measures, which can include tariffs, quotas, or other trade restrictions, are designed to provide a breathing period for the domestic industry to adjust to increased competition.

In the minerals and metals sector, safeguard measures are often employed when a sudden influx of cheap imports threatens to undermine the competitiveness or sustainability of local producers. In April 2025, India imposed a 12 % safeguard duty on flat steel products for 200 days after imports reached a nine-year high of 8.3 Mt, largely from China, South Korea, and Japan. The measure is expected to cut imports by 15–20 % in FY2025–26, stabilizing domestic prices (previously down 8–10 % year-on-year) and enabling producers like Tata Steel and JSW to gain 3–5 percentage points of market share (S&P Global, 2025; Reuters, 2025). Similarly, Canada in 2019 imposed final safeguards on heavy plate and stainless steel wire, reducing imports by roughly 25 % under tariff-rate quotas and lifting domestic capacity utilization above 80 %, with steel plate prices rising 12–15 % (CBSA, 2019).

Safeguard Measures in International Trade of Metals



Under WTO rules (Agreement on Safeguards, Article 7), safeguard measures are intended to be

Recent Countervailing Duty (CVD) Cases in Metals (2021–2025)				
Year	Jurisdiction	Product / Metal link	Decision (CVD)	Details
2025	United States	Corrosion-Resistant Steel (CORE) (zinc/aluminum coated)	Final AD/CVD	~US\$2.9bn imports; 10 countries targeted
2022	European Union	Stainless Steel Cold-Rolled Flat Products (nickel-bearing) from India & Indonesia	Definitive CVD imposed	Anti-subsidy finding; protects EU mills
2021	European Union	Aluminium Converter Foil from China	Definitive CVD imposed	Intermediate for batteries/packaging
2024–25	United States	Aluminium Foil from China	CVD order maintained	Admin reviews/amendments in Dec 2024

temporary: they can only last four years initially, extendable to a maximum of eight years for developing countries, and must be progressively liberalized during their application. Importantly, safeguard-using countries are obliged to offer compensation to affected trading partners, often in the form of tariff concessions elsewhere, or face retaliatory action. India's 2025 safeguard has already drawn scrutiny from its major steel trade partners, echoing earlier disputes when such measures were challenged at the WTO.

WTO Safeguard Measures Process

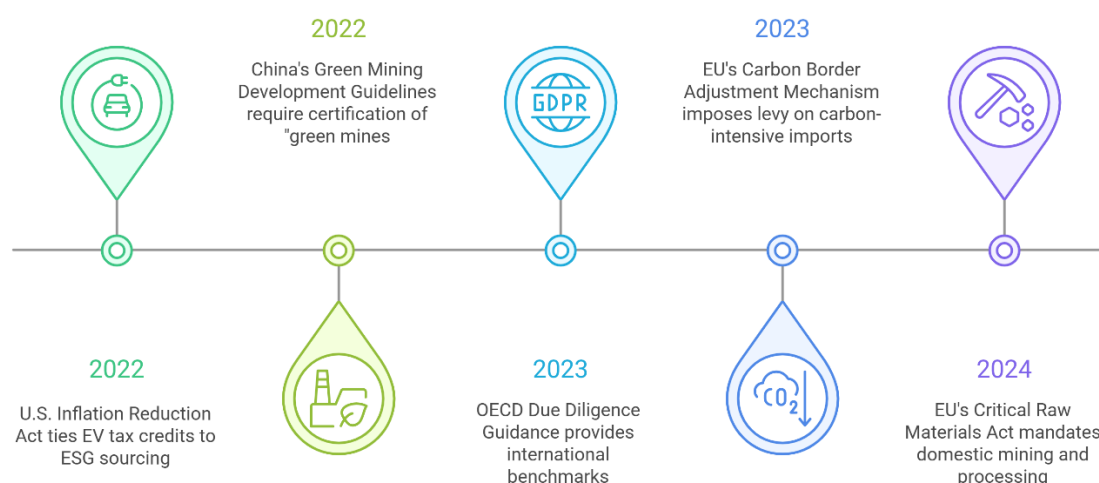


8. Sustainability and Environment

Sustainability and environmental standards are critical in managing the international trade flow of minerals and metals, ensuring that extraction, processing, and trade activities minimize environmental harm, promote social responsibility, and support long-term economic viability. These standards address environmental protection by regulating resource management, waste disposal, and emissions control, while also fostering social responsibility through community engagement, fair labor practices, and efforts to curb conflict minerals. Economically, they enhance market access, manage risks, and drive innovation, while ensuring compliance with international agreements and national regulations.

Sustainability standards now govern global mineral and metal trade, as regulators link market access to environmental, social, and governance (ESG) compliance. The OECD Due Diligence Guidance (2023) provides international benchmarks for conflict-free, socially responsible, and environmentally safe mineral sourcing (OECD, 2023). The EU's Critical Raw Materials Act (CRMA, 2024) mandates by 2030 that at least 10 % of critical raw materials be mined domestically, 40 % processed, and 25 % recycled, with import dependence capped at 65 % per supplier (European Commission, 2024). Complementing this, the Carbon Border Adjustment Mechanism (CBAM, 2023) imposes a levy on carbon-intensive imports—including steel, aluminium, and other metals—ensuring exporters from non-EU countries face higher costs if they fail to meet EU climate standards (European Commission, 2023). In the U.S., the Inflation Reduction Act (2022) ties EV tax credits to sourcing lithium, nickel, and cobalt from domestic or FTA partners with high ESG credentials (Congress.gov, 2022). Meanwhile, China's Green Mining Development Guidelines (2022) require certification of "green mines" covering energy efficiency, emissions, and land rehabilitation (China Ministry of Natural Resources, 2022). Collectively, these frameworks show how sustainability policies—OECD norms, EU CRMA and CBAM, U.S. IRA, and China's green mining rules—are reshaping mineral trade flows, rewarding low-carbon and traceable producers while raising costs and risks for exporters who fall short.

Global Sustainability Policies Reshaping Mineral Trade



9. Strategic Trade Policies

Strategic trade and industrial policies have become central to securing critical mineral supply chains, protecting emerging industries, and enhancing economic resilience. Major economies have combined subsidies, tariffs, export restrictions, and alliances to advance their mineral strategies.

United States: Rare Earths and Critical Minerals

China produced approximately 69.2% of global rare earths in 2024, and the U.S. imported about 77% of its supply from China (FDI Intelligence, 2024; Motley Fool, 2024). In response, the United States has enacted the Inflation Reduction Act (IRA) and invoked the Defense Production Act (DPA) to reduce dependence. Section 45X of the IRA provides a 10% production tax credit for domestically produced or allied-sourced critical minerals (CSIS, 2024). Through the DPA, since 2020, the Department of Defense has invested over US\$439 million in rare earth processing and magnet manufacturing, including a ~\$400 million equity injection and a \$150 million loan to MP Materials, operator of the Mountain Pass mine, to quintuple U.S. magnet output (FAS, 2024). These measures strengthen domestic supply chains, though they have also triggered Chinese export restrictions.

European Union: The Critical Raw Materials Act

The EU's Critical Raw Materials Act (CRMA), adopted in 2023, aims to reduce dependency on external suppliers. By 2030, the EU targets 10% of its critical raw materials from domestic extraction, 40% from processing, and 25% from recycling (European Commission, 2023). In 2025, the EU designated 47 strategic projects in 13 member states across rare earths, lithium, and nickel to build secure supply chains (Reuters, 2025). The CRMA streamlines permitting and provides access to financing, positioning Europe as a more resilient player in green and industrial transitions.

China: Export Controls and Industrial Policy

China remains the dominant actor in critical minerals but has shifted toward tighter control of its supply chains. In April 2025, Beijing imposed export restrictions and licensing requirements on seven rare earths and rare earth magnets (CSIS, 2025). Earlier, the Ministry of Industry and Information Technology (MIIT) tightened quotas and environmental compliance requirements for rare earth producers (AP News, 2024). These measures reinforce domestic control and align with Made in China 2025, which prioritizes value-addition in advanced materials.

India: The Critical Minerals Mission

India, heavily dependent on imports of lithium, cobalt, and gallium, has launched a National Critical Minerals Mission and published a strategic minerals list (Ministry of Mines, 2023). Partnerships with Zambia and Chile, backed by a US\$4 billion investment drive, aim to secure external supply (Times of India, 2024). Simultaneously, India is offering customs duty exemptions for mineral processing inputs to encourage downstream industries (Lakshmisri, 2023). These steps represent an early but ambitious attempt to embed India into global battery and clean-energy supply chains.

Indonesia: Nickel Export Ban

Indonesia, the world's largest nickel producer, accounted for ~30% of global nickel ore exports prior to 2020. In January 2020, it banned raw nickel ore exports to promote domestic smelting and refining (IEA, 2020). As a result, ore exports collapsed, but refined production surged: in 2023, Indonesia produced 2.03 million tons of contained nickel, becoming the world's top refined producer (Reuters, 2024). This shift exemplifies how resource-rich states can use export bans to foster domestic value-addition.

The United States and the European Union primarily rely on subsidies, tax credits, and international alliances to diversify and secure their mineral supply chains, while China leverages export controls and long-term industrial planning to preserve its strategic dominance in the sector. In contrast, India emphasizes capacity building and external partnerships to reduce dependency, and Indonesia has pursued export bans and industrial upgrading to move up the value chain. Collectively, these approaches reflect the varied strategic trade policies reshaping global mineral markets, demonstrating how governments balance national security, industrial development, and sustainability amid intensifying resource competition.



10. Trade Dispute Settlement Mechanisms

Trade disputes in the minerals and metals sector often arise due to conflicts over tariffs, market access, environmental regulations, and sustainability standards. Global and regional trade dispute mechanisms provide a formal structure to resolve these issues. These mechanisms are particularly important in the minerals and metals sector because this sector is often characterized by complex supply chains, reliance on natural resources, and diverse regulatory standards. The outcomes of these disputes can have significant impacts on trade flows, influencing the supply and demand dynamics for minerals and metals globally. Let's explore some of the most prominent trade dispute mechanisms and their relevance to the minerals and metals sector.

World Trade Organization (WTO)/ Dispute Settlement Mechanism (DSM)

The WTO Dispute Settlement Mechanism (DSM) is central to resolving minerals and metals trade disputes, ensuring compliance with global trade rules. A key case is China — Rare Earths (DS431), where

the U.S., EU, and Japan successfully challenged China's export duties and quotas on rare earths, tungsten, and molybdenum, with the WTO ruling these violated GATT obligations (WTO, 2014). More recently, Russia launched a WTO case in 2025 against the EU's Carbon Border Adjustment Mechanism (CBAM), claiming it breaches GATT and WTO rules (WTO, 2025). Such disputes can reshape trade flows by altering access to critical minerals or adding new compliance costs. However, challenges remain: environmental rules are complex to interpret, mining is politically sensitive, and enforcement is uncertain when states resist rulings—factors that create volatility in global mineral markets.

Regional Trade Agreements (RTAs) and Dispute Settlement Mechanisms

Regional trade agreements (RTAs) also provide dispute settlement frameworks that directly affect the minerals and metals sector. In the EU, the European Court of Justice (ECJ) rules on intra-EU disputes, including environmental and trade law; for example, the ECJ has upheld stricter environmental standards in mining and waste cases, shaping how member states implement EU directives (European Court of Justice, 2023). Under the USMCA, the dispute panel system has been used in cases such as Canada–U.S. softwood lumber and mining-related labor disputes, with the “facility-specific rapid response mechanism” allowing challenges to labor conditions in metal and mining facilities (USTR, 2023). In the Asia-Pacific, the Regional Comprehensive Economic Partnership (RCEP), which entered into force in 2022, includes a binding state-to-state dispute settlement mechanism that can address export restrictions or discriminatory market access rules affecting minerals (RCEP Agreement, 2020). These mechanisms shape trade flows by altering market access, raising compliance costs, or restricting exports, but remain constrained by differing environmental standards and the political sensitivity of resource nationalism.

Bilateral Dispute Resolution Mechanisms

Bilateral trade agreements increasingly feature dispute settlement mechanisms that directly shape the minerals and metals sector by managing tariffs, export restrictions, and market access. Notable examples include the U.S.–China disputes over rare earths, which extended from the WTO's China–Rare Earths ruling (2014) into bilateral negotiations during the U.S.–China trade war (2018–2020), reshaping rare earth and steel trade flows. The Australia–India Economic Cooperation and Trade Agreement (2022) created mechanisms to resolve frictions over critical minerals like lithium and cobalt, while the EU–Ukraine DCFTA (2016) has addressed tariff and regulatory disputes in steel and raw materials. Similarly, the Japan–Australia Economic Partnership Agreement (2015) manages coal and metals trade, and the Chile–China FTA (2005, upgraded 2019) provides a platform for resolving disputes in exports. While these mechanisms can stabilize supply chains and guarantee market access, they also face challenges: power asymmetries allow larger economies to exert disproportionate leverage, narrow sectoral focus often overlooks sustainability, and fragmentation risks undermining consistency with multilateral trade rules.

Trade dispute mechanisms, whether global (WTO), regional (EU, USMCA, RCEP), or bilateral, play a crucial role in the minerals and metals sector. These mechanisms provide a platform for addressing complex trade issues arising from environmental standards, tariffs, and sustainability regulations. However, challenges persist, including disagreements over environmental regulations, enforcement issues, and the political nature of trade disputes. The continued evolution of trade dispute frameworks will need to account for sustainability goals, market access concerns, and environmental protection to address these growing tensions effectively. These dispute mechanisms ultimately shape trade flows, influencing the availability, pricing, and sustainability of critical minerals and metals essential for the global economy.

Comparison of Trade Dispute Mechanisms

Mechanisms	WTO Dispute Settlement Mechanism	Regional Trade Agreements (RTAs)	Bilateral Dispute Resolution Mechanisms
Description	Compliance with global trade rules	Dispute settlement frameworks within regions	Manages tariffs, export restrictions, market access
Examples	China – Rare Earths (DS431), Russia vs. EU CBAM	EU (ECJ), USMCA, RCEP	U.S.–China disputes, Australia–India agreement
Impact on Trade Flows	Alters access to critical minerals, adds compliance costs	Alters market access, raises compliance costs, restricts exports	Stabilizes supply chains, guarantees market access
Challenges	Complex environmental rules, political sensitivity, uncertain enforcement	Differing environmental standards, resource nationalism	Power asymmetries, narrow focus, fragmentation risks

Summary

This Insight Paper explores the multifaceted relationship between trade policy and the global minerals and metals sector, a sector increasingly vital for infrastructure development, advanced technologies, and the transition to clean energy. It highlights how governments employ a wide range of instruments—tariffs, non-tariff barriers, export controls, subsidies, trade agreements, and dispute settlement frameworks—to regulate access, shape competitiveness, and secure strategic advantages.

Through case studies, the analysis illustrates the impact of these policies. The U.S.–China trade war and related tariffs raised costs for steel and aluminum, demonstrating how protectionist measures reverberate across supply chains. India’s imposition of a 50% duty on iron ore exports in 2022 temporarily disrupted global trade before its reversal, while Zambia’s experience with copper mis-invoicing revealed vulnerabilities in governance and revenue collection. Indonesia’s 2020 nickel export ban exemplifies resource nationalism, redirecting global supply chains and promoting domestic processing, whereas China’s restrictions on rare earths underscore how mineral dominance can be used for geopolitical leverage.

Trade agreements provide another lens. The China–Australia Free Trade Agreement (ChAFTA) facilitated Australian iron ore and coal exports, while the USMCA strengthened regional integration in North America. Similarly, the EU–Mercosur deal and the African Continental Free Trade Area (AfCFTA) aim to broaden market access. Subsidies, particularly in the U.S., EU, and China, highlight both industrial support for emerging industries and the potential for disputes over market distortion.

The paper emphasizes that trade policies in minerals and metals extend beyond economics; they are instruments of power, competition, and cooperation. It does not prescribe solutions but instead invites

readers to reflect on the trade-offs between national strategies, global sustainability goals, and the resilience of supply chains. By presenting these varied dynamics, the paper serves as food for thought on how trade policy will shape the future of critical resources.