

CRITICAL MINERALS

GLOBAL OVERVIEW AND THE SITUATION IN ARGENTINA

CEI Centre for
International
Economy



ARTICLE

Critical minerals

Global overview and the situation in Argentina

Executive summary

This report analyses the growing importance of certain minerals identified as “critical” in the context of digital transformation, the energy transition, and increasing geopolitical competition. These resources have become central components of the global economy, as they serve as key inputs for a wide variety of products, ranging from everyday items to cutting-edge technologies.

Global demand for these minerals is expected to grow significantly in the future, with estimates projecting increases of up to four times by 2040. However, supply faces structural constraints, notably the geographic concentration of production –particularly of processing capacities– along with high investment costs, long development timelines for new projects, and environmental requirements. These imbalances increase the risk of supply chain disruptions, price volatility and shortages, reinforcing the perception of the critical importance of these resources and the need to design specific policies for their management.

The lack of a universally accepted definition of what constitutes a critical mineral and the diversity of national criteria reflect divergent economic and strategic interests. While industrialised countries prioritise security of supply and the reduction of external vulnerabilities, countries rich in natural resources tend to focus their strategies on capturing greater value added and strengthening their productive capacities. This divergence in approaches translates into a wide range of policies, including production incentives, promotion of recycling, technological development, trade restrictions, and mechanisms for international cooperation.

Based on an analysis of 17 official lists, this study identifies 90 minerals considered critical at the global level, with a largely overlapping core of materials –such as rare earths, cobalt, lithium and nickel–. It is observed that, while trade in this group of minerals has grown steadily in recent years –with Asia as the main centre of demand and processing, and Oceania, the Americas and Africa as net suppliers–, at the same time trade restrictions on both exports and imports have increased, reflecting competition for control of resources and differing industrial policy strategies.

This scenario poses both risks and opportunities for resource-rich countries such as Argentina, which could position itself as a strategic supplier in an expanding global market, particularly for certain key commodities, notably lithium and copper.

1. Introduction

Historically, humans have used minerals and metals in their daily lives. In ancient times, our ancestors learned various ways to work with the metallic minerals found in their environment, including copper, tin and iron, as well as precious metals such as gold and silver. Innovations during the Industrial Revolution led to the discovery of new mineral resources and the rise of the steel industry. After World War II, this industry grew alongside the use of oil and minerals such as aluminium, zinc, manganese and chromium.

As a result, the intensity of mineral use in industrial production has grown exponentially. Today, minerals are key inputs for agricultural and industrial production and are essential to the functioning of modern technologies, ranging from electric vehicle batteries and photovoltaic cells to fibre-optic cables and semiconductor chips, as well as the latest innovations in the medical, aerospace and defence industries.

Digital transformation and the energy transition, coupled with a landscape of growing geopolitical competition, have given minerals and metals a more prominent role. While demand for these resources is expected to grow exponentially in terms of both volume and variety, supply is not expected to keep pace with these increased demands, which could lead to supply shortages and disruptions in supply chains.

As a result, both production of and access to key metals and minerals have become a top priority on the political and economic agendas of many governments, which have identified several of them as “critical” due to the risks associated with their availability and accessibility, and have established strategies to ensure a continuous and secure supply.

This paper aims at providing an overview of minerals and metals and examines the supply and demand dynamics that govern international markets. It details the characteristics that qualify a mineral as “critical”, as well as the official lists and strategies that various countries –both those that rely on raw materials imports and those rich in mineral resources– have developed for risk mitigation or promoting activities related to these raw materials. It also explores the international trade network for these resources and the associated trade policies. Finally, it analyses the natural resources Argentina possesses that position it as a supplier of some of these key minerals.

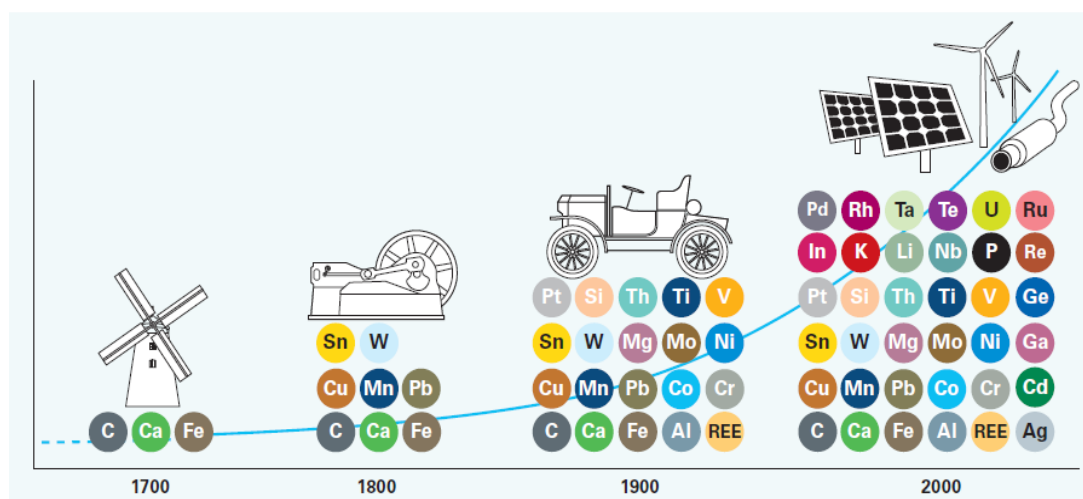
2. Mineral uses and outlook of the demand

As mentioned in the previous section, minerals and metals are indispensable for countless aspects of daily life, contributing to food, housing, infrastructure, transportation, communications, healthcare and defence. Among the minerals used in common applications are iron for steel production, copper used in electrical wiring, and titanium used in aircraft frames, among others.

The development of new technologies and products has given rise to more demand for an increasingly wide range of metallic and non-metallic minerals that perform essential functions in a wide variety of products¹.

¹ For example, in the 1980s, 12 elements were used in the manufacture of computer chips. A decade later, 16 were used, and by 2006, 60 elements were used in their production (Schulz, *et al.* (2017). *Critical mineral resources of the United States - An introduction*).

Graph 1. Evolution of elements commonly used in various energy applications



Note: the position on the time axis is merely indicative.

Source: Zepf, et al. (2014). *Materials critical to the energy industry. An introduction. 2nd edition*

Minerals such as lithium, graphite and cobalt are now essential for energy storage. Copper, aluminium and nickel are needed in a wide variety of renewable energy applications. The production of electric vehicles involves the use of minerals such as iron and steel, cobalt, lithium, nickel, manganese, copper and rare earth elements, among others.

Rare earths²

The term “rare earths” refers to a group of 17 chemical elements with similar chemical properties (the 15 lanthanides, plus scandium and yttrium), each having different optical, magnetic and electronic properties.

Despite their name, these elements are neither earths nor rare. The term “earth” is an old name for oxides and for those minerals that had an earthy appearance. The term “rare” does not refer to their scarcity in the Earth’s crust, but rather to the difficulty in finding them in sufficiently high concentrations and extracting them in an economically viable manner, since isolating the elements from the minerals in which they are found is technologically complex.

The importance of rare earth elements lies in their wide range of applications, their unique properties and their high unit value. For example, colour cathode-ray tubes and liquid crystal displays in monitors and televisions contain europium, while erbium is used in the manufacture of fibre-optic telecommunications cables. Lutetium is employed in oil refineries as a catalyst, while samarium is an essential element in the manufacture of electric guitar pickups. Lanthanum is used in the production of optical glass and camera lenses, dysprosium for nuclear reactors and computer hard drives, and neodymium for the construction of permanent magnets, photochromic lenses, and laser equipment for eye and dental surgeries.

Among other materials, tantalum is used for the production of mobile phones; indium is used to manufacture liquid crystal displays; semiconductors require silicon, gallium, cobalt, germanium, arsenic, antimony and indium; and photovoltaic cells require silicon, gallium, cadmium, selenium, tellurium and indium. Other minerals are essential for the health and medical sectors (for example, beryllium, cadmium, and platinum group metals³), as they are key components in medical research,

² USGS (2002). *Rare Earth Elements - Critical Resources for High Technology*.

³ The platinum group metals are platinum, palladium, iridium, rhodium, ruthenium and osmium.

cancer treatments and radiation therapy, X-rays, magnetic resonance imaging and computed tomography. They are also fundamental to the defence industry, as many minerals (including beryllium and germanium) are used in the manufacture of guided missiles, night-vision goggles and precision weapons, among other applications, so their dual-use nature⁴ presents another set of challenges.

So, in addition to the increased demand for minerals driven by population growth and economic development, there is also a growing need for minerals related to digital transformation and energy transition.

By the beginning of this decade, various reports from international organisations had already predicted that the global demand for minerals would grow exponentially. The International Energy Agency⁵ estimated that demand for minerals used in clean energy technologies could increase two- to fourfold by 2040⁶, while the World Bank⁷ projected that demand for minerals used in energy storage technologies (such as lithium, graphite and cobalt) would increase by as much as nearly 500% by 2050. The IMF⁸, in turn, estimated that the total value of the metal production will multiply by over four between 2021 y 2040.

However, it is unlikely that this growing demand for minerals and metals will be accompanied by a similar rate of increase in supply, at least in the short and medium term, as supply is constrained by the depletion of high-grade deposits, the long lead times required to bring projects online, and environmental requirements –not to mention geopolitical issues related to the location of resources. This imbalance between supply and demand could lead to bottlenecks, high price volatility, supply shortages and disruptions in supply chains.

3. Dynamics of the mining supply

Mineral resources are not evenly distributed throughout the Earth's surface. While some are very abundant, others are scarce; there are few known deposits, or they are concentrated in small geographic areas. In addition to natural conditions, available technology and economies of scale mean that mining is not equally feasible in all countries.

Furthermore, minerals present in low concentrations rarely constitute economically viable deposits and are typically extracted primarily as co-products or by-products of host mineral extraction⁹. Therefore, the availability of these by-products –or associated minerals– depends not only on the host mineral's production but also on whether the decision is made to recover the associated minerals or discard them unprocessed.

⁴ Dual-use goods (or dual-use items) are products, software or technologies that can be used for both civilian and military purposes (for example, drones, chemicals and encryption software). Their export, transit and intermediation are generally regulated.

⁵ IEA (2021). *The Role of Critical Minerals in Clean Energy Transitions*.

⁶ The most recent estimates show that by 2050, demand for lithium is expected to increase by a factor of 3 to 14 (depending on the scenario); nickel, by a factor of 1.5 to 13; graphite, by a factor of 2 to 5; cobalt, by a factor of 2 to 4; rare earth elements, by a factor of 1.5 to 3; and copper, by a factor of 1.2 to 1.9 (IEA (2025). *Global Critical Minerals Outlook*).

⁷ World Bank (2020). *Minerals for Climate Action: The Mineral Intensity of the Clean Energy Transition*.

⁸ IMF (2021). *Energy Transition Metals*. IMF Working Paper, October.

⁹ For example, cobalt is generally a co-product or by-product of nickel and copper mining, while indium is obtained as a by-product of zinc extraction. For more information, see: Nassar *et al.* (2015). *By-product metals are technologically essential but have problematic supply*. *Sci. Adv.* 1, e1400180.

These factors often result in mineral extraction being concentrated in the hands of one or a few players. For example, Brazil is the leading producer of niobium; South Africa stands out in the extraction of platinum group metals; the Democratic Republic of the Congo (DRC) accounts for almost all cobalt mining, and Indonesia for nickel; while China holds dominant positions in the mining of mercury, tungsten, graphite, vanadium, rare earths, fluorite, magnesium and antimony, among others (Table 1).

Table 1. Estimated production of selected minerals
2022-2024 average

EXTRACTION				PROCESSING			
Mineral	World total (tonnes)	Leading country	Leading country share (%)	Mineral	World total (tonnes)	Leading country	Leading country share (%)
Ruthenium (PGM)	30	South Africa	93%	Gallium	668	China	98%
Niobium	100,770	Brazil	92%	Magnesium	983,000	China	91%
Iridium (PGM)	7	South Africa	89%	Metallic silicon	4,185,400	China	83%
Mercury	1,163	China	86%	Bismuth	17,067	China	82%
Rhodium (PGM)	22	South Africa	84%	Cobalt	170,500	China	80%
Tungsten	80,100	China	83%	Tellurium	937	China	76%
Graphite	1,614,000	China	77%	Indium	1,033	China	68%
Cobalt	241,974	DR Congo	74%	Titanium	307,200	China	68%
Platinum (PGM)	175	South Africa	70%	Germanium	140	China	68%
Rare earths	353,907	China	69%	Aluminium/bauxite	141,500,000	China	59%
Vanadium	102,000	China	68%	Tin	349,000	China	51%
Boron/borates	4,185,000	Türkiye	64%	Selenium	3,580	China	50%
Fluorite	9,116,700	China	64%	Zinc	12,900	China	49%
Magnesium	22,100,680	China	59%	Arsenic	60	Peru	48%
Antimony	96,370	China	56%	Platinum (PGM)	271	South Africa	48%
Nickel	3,557,370	Indonesia	54%	Helium	172	US	47%
Beryllium	334	US	54%	Copper	26,633,000	China	44%
Rhenium	61	Chile	48%	Lead	11,900,000	China	44%
Phosphate rock	233,640,000	China	46%	Cadmium	23,570	China	39%
Lead	4,376,700	China	44%	Palladium (PGM)	333	South Africa	26%
Tantalum	2,043	DR Congo	44%				
Chromium	45,566,700	South Africa	44%				
Lithium	196,700	Australia	43%				
Palladium (PGM)	201	Russia	42%				
Molybdenum	253,700	China	41%				
Strontium	511,960	Spain	39%				
Iron	1,540,221,700	Australia	38%				
Manganese	19,866,700	South Africa	37%				
Zirconium	1,460,000	Australia	34%				
Zinc	12,200,000	China	33%				
Potash/potassium	43,600,000	Canada	33%				
Barite/barium	8,205,520	India	32%				
Feldspar	33,495,350	Türkiye	28%				
Aluminium/ bauxite	429,749,300	Guinea	27%				
Copper	22,500,000	Chile	24%				
Tin	304,000	China	23%				

Note: PGM: Platinum group metals

Source: DNCEI based on USGS data

In other cases, the main players are just two countries: Spain and Iran account for 78% of strontium extraction; Russia and South Africa represent 78% of palladium mining; and in the case of lithium, rhenium, chromium, tantalum and manganese, the top two producers together comprise more than 60% of global exploitation.

Furthermore, the deployment of mineral refining facilities –which requires complex engineering and technologies– is closely linked to a country’s manufacturing industry and competitiveness. Consequently, industrialised countries, like Japan and South Korea –which are not leading mining nations– are among the key players in the processing stage for certain minerals, such as titanium, cadmium and indium. In contrast, most mineral-rich countries have a smaller share in the processing stage than in the extraction one.

China is a special case because, in addition to being rich in mineral resources, it has developed significant refining capacity for many minerals, thereby outperforming its own performance in the extraction phase. For example, while three-quarters of global cobalt production takes place in the DRC and only about 1% in China, 80% of all cobalt produced worldwide is refined in China. Similarly, China’s share of refining is higher than its share of extraction for aluminium, copper, magnesium, titanium, tin and zinc. Furthermore, it accounts for a large portion of the refining of gallium, germanium and rare earths¹⁰.

Regardless of the geographic concentration of mineral extraction and refining, derived from the mining industry’s high capital intensity, it is also evident that only a few large multinational corporations and state-owned enterprises dominate the sector. Often, these companies are not incorporated in the countries where they conduct their mining operations. For example, although the Democratic Republic of the Congo is the largest producer of cobalt, the main companies involved in extraction are based in the United Kingdom, Switzerland and China, while the leading Congolese company ranks fourth, with a 9% market share of global production¹¹. Likewise, thanks to an active policy of acquiring stakes in companies in other countries by Chinese firms, China controls mining companies engaged in extraction and processing that are not incorporated in China¹².

In turn, global reserves¹³ of minerals are distributed relatively more evenly than extraction (Table 2), which, combined with the expected increase in demand, could open up opportunities to diversify supply in the future. For example, South America has significant reserves of lithium, copper, niobium, graphite and rare earth elements, among other minerals, while African countries hold significant reserves of cobalt, platinum group metals, chromium, manganese and bauxite.

¹⁰ Chung *et al.* (2025). *Global maps of critical mineral production in 2023*, USGS Fact Sheet 2025–3038.

¹¹ IRENA (2023). *Geopolitics of the energy transition: Critical materials*.

¹² Leruth *et al.* (2022). *Green Energy Depends on Critical Minerals. Who Controls the Supply Chains?*

¹³ A mineral resource is a concentration of minerals found in the Earth’s crust, but it is not necessarily economically viable to exploit under current conditions. In contrast, a mineral reserve is a portion of the resource that has been evaluated and is considered economically feasible to extract and process using current technology and at current prices. For example, according to 2025 data from the USGS, Bolivia is one of the countries with the largest lithium resources worldwide (23 million tonnes), but it has virtually no reserves; whereas in Chile –which has 13 million tonnes of resources– more than 70% of the resources are considered reserves.

Table 2. Estimated reserves of selected minerals

Year 2024

Mineral	Total world (in thousand tonnes)	Leading country	Leading country share (%)
Niobium	> 17,000	Brazil	89.8%
Zirconium	70,000	Australia	78.6%
Palladium (PGM)	81	South Africa	77.8%
Phosphate rock	74,000,000	Morocco	67.6%
Indium	1,8	China	61.1%
Cobalt	11,000	DR Congo	54.5%
Tungsten	4,600	China	52.2%
Rare earths	> 90,000	China	48.4%
Vanadium	18	Australia	47.2%
Chromium	> 1,200,000	Zimbabwe	45.0%
Nickel	> 130,000	Indonesia	41.9%
Molybdenum	15	China	39.3%
Lead	96,000	Australia	36.5%
Manganese	1,700,000	South Africa	32.9%
Lithium	30,000	Chile	31.0%
Iron	88,000	Australia	30.7%
Magnesium	7,700,000	Russia	29.9%
Antimony	> 2,000	China	29.7%
Selenium	92	Russia	28.3%
Graphite	290,000	China	27.9%
Zinc	230,000	Australia	27.8%
Fluorite	320,000	China	26.9%
Bauxite	29,000,000	Guinea	25.5%
Tin	4,200	China	23.8%
Potash	4,800,000	Canada	22.9%
Copper	980,000	Chile	19.4%
Tellurium	35	Russia	16.6%

Nota: PGM: Platinum group metals.

Fuente: DNCEI based on USGS data

Furthermore, large areas of the Earth's crust remain unexplored, particularly in developing countries. In fact, given the growing demand for certain minerals and in an effort to reduce dependence on imports, some are seeking to exploit the seabed, although this is an incipient issue that is not without controversy.

Seabed mining¹⁴

Deep-sea mining seeks to extract mineral deposits found on the ocean floor. These minerals can be found in slowly forming polymetallic nodules (about the size of a potato), in polymetallic sulphides (large deposits of sulphur compounds and other metals that form around hydrothermal vents), and in metal-rich crusts on seamounts.

¹⁴ World Resources Institute (2025). *What We Know About Deep-Sea Mining - and What We Don't*; World Economic Forum (2025). *Deep-sea mining: What you need to know*; Congressional Research Service [CRS] (2025). *Critical Minerals on the U.S. Outer Continental Shelf: The Bureau of Ocean Energy Management's Role and Issues for Congress*.

Although interest in the seabed has existed for decades, recent technological advances have made it possible to exploit these areas by sending vehicles to extract mineral deposits from the ocean floor. However, the future of this industry remains uncertain, given the limited knowledge we still have about the ocean depths and the potential environmental consequences for marine life and the planet.

The exploitation of seabed resources is divided into two main areas. On the one hand, there is the continental shelf, which extends from a State's coastline to a minimum of 200 miles and can reach a maximum of 350 miles depending on the morphology of the continental shelf. In this zone, coastal States exercise sovereign rights over the seabed and subsoil, and are the only entities authorised to explore and exploit resources, always in accordance with the objectives of the United Nations Convention on the Law of the Sea (UNCLOS). Some countries have already approved permits to explore for mineral resources in their national waters.

Beyond the continental shelf lies the Area, comprising the seabed and subsoil beyond the limits of national jurisdiction, which is governed by UNCLOS and administered by the International Seabed Authority (ISA). The ISA has been awarding exploration contracts since 2001 and has a mandate to establish regulations for deep-sea mining in the Area, but to date, its members have not reached an agreement on the regulatory framework that will govern commercial mining operations in international waters. The latest round of talks concluded in July 2025, and negotiations will resume in 2026.

Several countries have taken steps to begin mining minerals within their exclusive economic zones and extended continental shelves, including Norway¹⁵, India, Japan and the Cook Islands. The US government –which is not a party to UNCLOS– also seeks to accelerate the exploration, development and processing of seabed minerals. To that end, it has declared seabed mineral resources a matter of national security and an economic priority, emphasising the need to ensure a reliable supply of minerals independent of foreign control¹⁶.

Meanwhile, nearly 40 countries around the world have called for a moratorium, a precautionary pause, or a ban on deep-sea mining –whether in international waters, national waters or both– until more information is available on its potential negative consequences (including Canada, Brazil and several European countries)¹⁷.

4. What are critical minerals? Definitions, lists and strategies

4.1. Definitions and lists

Although the Earth's crust contains a wide variety of minerals and metals, only a few of them are considered critical. Many countries recognise the crucial role that certain minerals play in their economies and societies, and, in response, they have developed criticality analyses to identify them and have enacted laws, regulations, policies and initiatives to secure and manage the supply of these essential resources.

However, there is no globally accepted definition of "critical mineral"¹⁸. The factors used to determine criticality are subjective and specific to each country, and they may change over time depending on the needs of each economy and its industries.

Generally speaking, the term "**critical mineral**" refers to raw materials (minerals and metals) that are **of great strategic and economic importance to the development of an industry or**

¹⁵ <https://www.sodir.no/en/facts/seabed-minerals/environmental-impact-assessment/>.

¹⁶ Executive Order 14285 (24/04/25), *Unleashing America's offshore critical minerals and resources*.

¹⁷ <https://deep-sea-conservation.org/solutions/no-deep-sea-mining/momentum-for-a-moratorium/governments-and-parliamentarians/>.

¹⁸ They are also often referred to as "critical materials", "rare metals" or "critical raw materials", among other terms.

sector that is a priority for a country, for which the continuous and secure supply of these resources is of vital significance.

A key factor is the country's or sector's position in the supply chain. Thus, **mineral-demanding countries** located in the intermediate or final stages of supply chains when defining "criticality" prioritise the economic importance of the industry and the level of supply risk for those minerals they do not produce (or that they produce in limited amounts). To do so, they evaluate factors such as supply shortages, geographic proximity, market access, price volatility, the complexity of extraction and refining processes, concentration in different parts of the value chain, and the presence (or absence) of viable substitutes. Other variables also play a role, such as governance issues, external crises and geopolitical challenges

This definition is generally adopted by advanced economies with extensive industrial capabilities, such as the United States, the EU, Japan and South Korea, which require certain inputs on a large scale and generally rely on imports. Their strategies focus on securing future supply and addressing the risks of disruption, whether through diversification of supply sources, development of the local industry, or innovation, substitution, or recycling. For this group of countries, it also often involves a matter of national security due to the intensive use of these materials in advanced defence technologies.

The first definitions of critical minerals in the **United States** emerged during World War II, due to the need for certain materials for military defence¹⁹. Over the past few decades, interest has expanded to sectors related to advanced consumer technologies and energy infrastructure. The first list compiled by the US Geological Survey (USGS) dates back to 2018 and included 35 critical raw materials²⁰.

Under the Energy Act of 2020, a mineral is considered critical if it meets the following three criteria: i) it is essential to economic or national security; ii) it serves an essential function²¹ in the manufacture of a product, its absence would have significant consequences for the country's economic or national security, and iii) its supply chain is vulnerable to disruptions. Mineral fuels, water, ice, or snow, as well as common varieties of sand, gravel, stone, pumice, ash and clay are not considered critical minerals.

The law sets forth that the list of critical minerals and the methodology used to identify them must be reviewed and updated at least once every three years. The latest list available, published in 2025, includes 60 critical minerals²².

In preparing this report, the USGS used an economic model to estimate the potential effects of disruptions in the international mineral trade on the US economy²³. In order to determine whether the economic consequences of a supply disruption are significant or not, both the economic effects and the likelihood of various scenarios occurring were taken into account. When the risk of trade disruption was deemed high, elevated or moderate, the product was proposed for inclusion on the list. In addition, minerals for which there is a single domestic producer were also included.

¹⁹ US Strategic and Critical Materials Stock Piling Act of 1939.

²⁰ The US Department of Energy also maintains a list of critical minerals for energy <https://www.energy.gov/cmm/what-are-critical-minerals-and-materials>, which complements the lists published by the USGS.

²¹ "Essential" means that the chemical and physical properties of a mineral make it difficult or impossible to find a substitute that can perform a similar function at a comparable cost.

²² The Appendix enumerates all the official lists of critical minerals that were analysed, along with links to the corresponding websites.

²³ In the previous list (2022), the USGS used a methodology based on indicators rather than a probabilistic model. It assessed supply risk based on three factors: i) the potential for supply disruption by the supplier country; ii) commercial exposure (degree of dependence on imports); and iii) economic vulnerability (importance of the product to the local economy). All minerals with a supply risk exceeding a certain threshold and those with a single local producer were classified as "critical." See: <https://pubs.usgs.gov/of/2021/1045/ofr20211045.pdf>.

With regard to the **European Union**, one of the top priorities of its Raw Materials Initiative²⁴ of 2008 was to establish a list of critical raw materials, considered essential to the economy and subject to a high risk of supply disruption. The first list was published in 2011 (consisting of 14 critical materials), and it was decided that it would be updated every three years.

The current list, published in 2023, includes 34 critical raw materials. The methodology used for its compilation was based on a matrix with two main axes: economic importance and supply risk. To assess the economic importance, the value of each mineral to the manufacturing industry and the potential for substitution were analysed. For supply risk, the concentration of production, the governance of supplier countries, the contribution of recycling, and dependence on imports were examined. Once the group of critical minerals was defined, a subset of 17 “strategic” raw materials were identified²⁵, which are essential for green, digital, space and defence transitions.

For **countries rich in mineral resources** (or with advantages in processing them), the identification of critical minerals by consumer economies poses an opportunity. They do not focus so much on resource scarcity as on their strategic value. They have an interest in leveraging their position to gain a competitive advantage, drive economic development, increase their industrial capacity, or attract investment toward more advanced segments of the value chains. In general, they tend to refer to these minerals as **strategic** and consider issues such as the concentration of their export markets, risks related to shifts in demand due to technological changes, the availability of substitutes for minerals currently considered critical, or the policies used by industrialised economies to diversify their markets.

Among the countries that want to position themselves as key suppliers in the global market are Australia and Canada. This group also includes several mineral-rich developing countries that are seeking to increase their mining potential and develop their mining industries, such as South Africa, Malaysia, Indonesia, Nigeria and the Democratic Republic of the Congo.

In **Canada**, a mineral is considered critical if: i) the supply chain is under threat, and ii) there is a reasonable possibility that the mineral is produced in Canada. In addition, it must be essential to economic or national security, necessary for the transition to a sustainable, digital and low-carbon economy, or position Canada as a sustainable and strategic partner within global supply chains. Its list of critical minerals –updated in 2024– identifies 34 critical minerals and metals.

Similarly, in **Australia**, for a mineral to be selected for inclusion on the list of critical materials, it must be essential to modern technologies, the economy or national security; vulnerable to supply chain disruption; besides, the country must have geological potential for that resource. The most recent list (2024) includes 31 raw materials selected based on their geological endowment and the country’s potential to meet global technological needs, particularly those of its major partners. It also identifies a group of “strategic” materials that meet the same criteria as critical materials but whose supply chains are not currently sufficiently vulnerable to disruptions.

In turn, **China** –which faces both the typical challenges of producing countries and those common to mineral-rich economies– bases its assessment of criticality on various criteria. On the one hand, it considers the importance of a given material for its economic development and emerging industries, its applications in national security and defence, and supply risk. On the other hand, it has defined a series of “strategic advantageous minerals,” for which it has

²⁴ https://single-market-economy.ec.europa.eu/sectors/raw-materials/policy-and-strategy-raw-materials_en.

²⁵ To determine their importance, the following factors are taken into account: the number of strategic technologies that use them as inputs, the amount of raw material required for their production, and the expected global demand for these technologies.

abundant resources and a competitive advantage or dominant position that it could leverage to pursue strategic objectives. It maintains an official catalogue, developed as part of the National Mineral Resources Plan (2016–2020), which includes 24 strategic minerals, divided into metallic, non-metallic and energy minerals.

In a similar manner, **Brazil** and **New Zealand** use both approaches when compiling their lists of critical/strategic minerals, as they distinguish in their lists between those resources for which they have domestic production and comparative advantages and those for which they rely on imports and which are necessary to supply vital sectors of the economy.

Finally, as mentioned at the beginning of this section, the criterion of criticality is not static, since the importance of certain minerals can vary over time in response to changes in supply and demand and to each country's political priorities²⁶. These changes may result from geological discoveries, technological innovation, improved recycling options, or an increasing ability to obtain materials as by-products of the extraction of other minerals.

4.2. Which minerals are considered critical?

A total of 17 official lists are analysed in this article²⁷. They have been issued by governmental organisations in the last ten years and were published up to November 2025²⁸. If a country had submitted more than one list, only the most recent one was considered.

It is important to note that in many lists, rare earth elements are treated as a single category (either as a single material –Canada, Australia– or divided into two groups: light and heavy rare earth elements –the EU–), while in others they are listed separately (the US and South Korea). Furthermore, certain countries classify only some of the rare earth elements as critical. Something similar occurs with platinum group metals. Therefore, to ensure the figures are comparable, this study counted each of the 17 rare earth elements individually, as well as the six platinum group metals. This is why the number of critical minerals reported by each country in Figure 2 may differ from that listed in official records²⁹.

A comparison of the lists reveals that they differ in both length and content, ranging from some containing fewer than 10 minerals (such as those for the Democratic Republic of the Congo, with 4, and Nigeria, with 8) to others that include more than 50 (Indonesia, the United States, New Zealand, Japan, Canada, Australia and the EU).

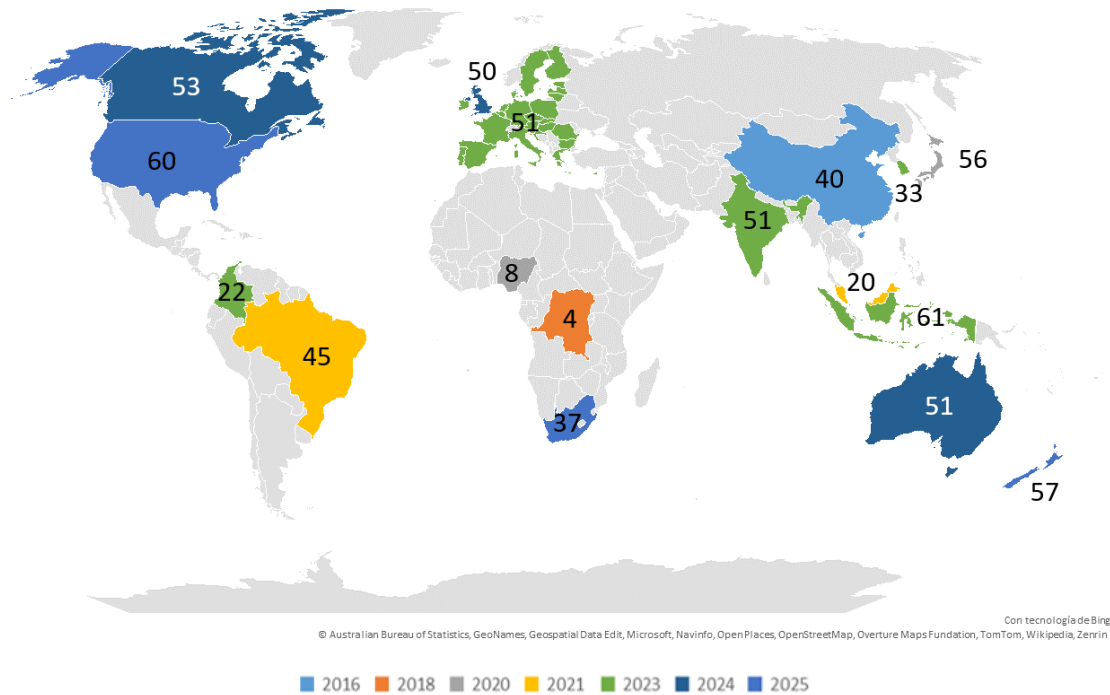
²⁶ For example, helium was considered a national security resource for much of the 20th century (it was used in airships and rocket technology), but as new ways were found to capture or substitute it, its strategic criticality declined. In contrast, a few decades ago, rare earth elements and lithium attracted virtually no strategic interest.

²⁷ The Appendix contains links to all the lists of critical or strategic minerals included in the analysis.

²⁸ Within the EU, Spain, France, Finland and Germany have their own lists in addition to the EU's common list, but these were not included in this compilation. Norway, in particular, has a minerals' strategy, but it is based on the EU list, so it was not included either.

²⁹ For example, in the case of the EU, according to the latest official list, there are 34 critical raw materials. Since the EU groups rare earth elements into two categories (light and heavy rare earth elements) and treats five of the platinum group metals as a single element, when each of these minerals is considered separately, the final number of critical minerals rises to 51.

Graph 2. Countries with official lists of critical/strategic minerals, by year of publication and number of minerals on each list

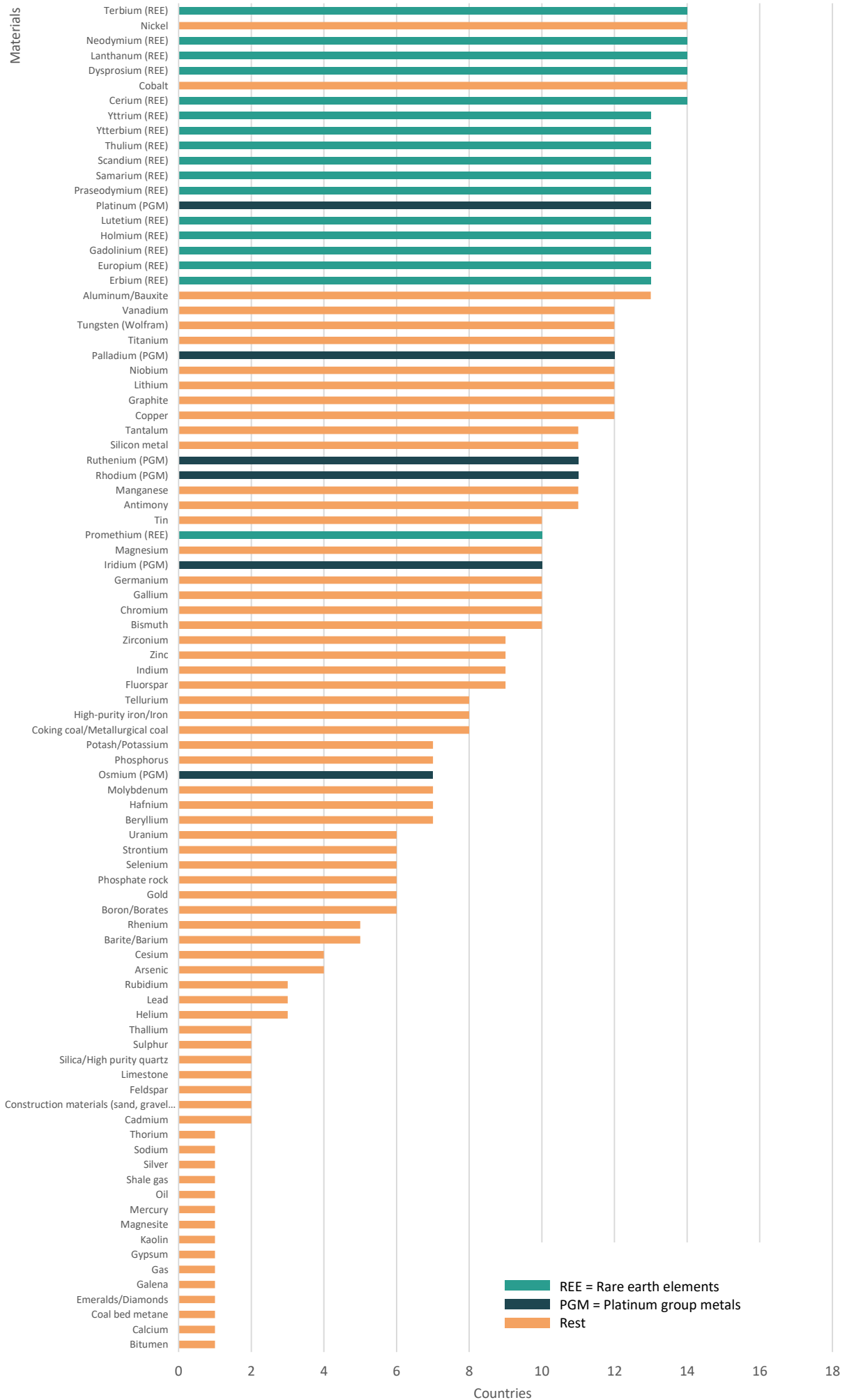


Source: DNCEI based on official lists of critical minerals

Most of the lists refer exclusively to non-fuel minerals (as is the case in the US, the UK and New Zealand), while others include materials related to energy production (China, which includes oil and gas, or South Africa, which includes coal and uranium) or to food security and the development of public infrastructure (for example, Colombia, which includes fertilisers and construction materials).

In total, the lists analysed contain 90 minerals considered critical by at least one country (Graph 3). None of the minerals is mentioned in all the lists. The most frequently cited minerals number 20 (present in 13 or 14 lists, i.e., in more than 75% of cases), and include nearly all rare earth elements, platinum, aluminium/bauxite, cobalt, and nickel.

Graph 3. Materials classified as critical/strategic (17 lists, 89 materials)



Source: DNCEI based on official lists of critical minerals

A total of 46 minerals appear on more than half of the lists. In addition to the 20 already mentioned, the following are included: graphite, lithium, niobium, palladium, titanium, tungsten and vanadium (present on 12 lists); and three platinum group metals (ruthenium, rhodium and iridium), promethium (the remaining member of the rare earth elements), antimony, bismuth, zirconium, chromium, copper, tin, fluorite, gallium, germanium, indium, magnesium, manganese, silicon, tantalum and zinc (present in 9 to 11 lists).

The only lists that do not include rare earth elements as critical minerals are those of Colombia, Nigeria and the Democratic Republic of the Congo, while the lists of these last two African countries –as well as those of China and Malaysia– do not include any platinum group metals.

On the other hand, 15 minerals appeared on only one list (including several fuel minerals), and seven other minerals appeared on only two lists.

These results highlight the similarities and differences in how each country defines what constitutes a critical or strategic mineral.

4.3. Official strategies

To manage the risks and challenges associated with access to minerals and their production, various economies have developed strategies to ensure a continuous and secure supply of these resources.

Countries with the highest levels of import dependence have focused on developing strategies to build their mineral extraction and processing capacity and reduce external purchases –for example, by supporting innovations that increase the recyclability of materials, identify substitute materials or develop mining technologies that make it possible to exploit currently unfeasible mineral reserves–. To this end, they employ various measures, such as granting state aid, utilising public procurement, establishing strategic reserves and managing foreign investments. The European Union, Japan, the United Kingdom and the United States are among the countries that have adopted strategies in this direction.

Since 2017, the **US** government’s primary focus has been on identifying and mitigating supply chain vulnerabilities, declaring reliance on foreign sources a threat to the country’s national and economic security. In 2019, the Department of Commerce published the Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals³⁰, aimed at promoting domestic production and the development of substitutes, advancing recycling technologies, investing in research and development, and collaborating with international partners to ensure access to these minerals, whether through agreements or partnerships³¹ or by promoting foreign investment. In addition, critical minerals were incorporated into the clean energy agenda, and substantial funding was provided for various projects related to the extraction or refining of critical minerals –for example, through the Bipartisan Infrastructure Law and the Inflation Reduction Act–.

³⁰ Executive Order 13817 (20/12/2017). *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*.

³¹ The United States has signed several Memorandums of Understanding (MOUs) to strengthen cooperation on critical minerals, including those with Argentina, Peru, Uzbekistan, India and Saudi Arabia, as well as the Critical Minerals Agreement with Japan. It is also a participant in various multilateral initiatives, including the Minerals Security Partnership (MSP).

More recently, the strategy has shifted toward a broader energy framework (promoting all forms of energy) and national security and defence³². The government aims to boost the local mining industry –including seabed mining– and streamline the process for obtaining mining permits on federal lands³³. In addition, it has taken a more active role in investment by restructuring loans and purchasing shares in key mining and processing companies to ensure the viability of domestic projects³⁴. It has also strengthened policy and investment coordination to secure the supply of critical minerals and metals through bilateral agreements with like-minded partners and allies³⁵.

As for the **European Union**, the cornerstone of its critical minerals strategy is the Critical Raw Materials Act³⁶, which entered into force in May 2024, and aims to ensure a secure and sustainable supply of critical minerals for the industry and seeks to significantly reduce the EU's dependence on imports from a single country. It includes measures to strengthen European supply chains; invest in research, innovation, and capabilities, and to promote recycling to bolster the secondary market for minerals.

The law sets benchmarks that domestic capacity must meet by 2030: 10% of the EU's annual needs will be met by extraction from European mines; 40% by processing on European soil; and 25% by recycling. Furthermore, no more than 65% of the EU's annual consumption of any strategic raw material may come from a single third country.

Given that the potential for diversifying suppliers through traditional trade channels is limited (more than 90% of the EU's imports of critical raw materials are already duty-free), the EU is developing a critical raw materials diplomacy strategy by signing Memorandums of Understanding (MoUs) with various supplier countries³⁷.

Another tool used to achieve the objectives set forth in the law is the selection of strategic projects (both within the EU and in third countries), which will receive expedited permits and financing support. In addition, the European Critical Raw Materials Centre was launched, which will serve as a central hub for market intelligence, joint mineral procurement, and strategic stockpile management. Furthermore, restrictions on the exports of permanent magnet scrap

³² In this regard, the United States conducted an investigation into threats to national security posed by the importation of critical minerals under Section 232 of the Trade Expansion Act of 1962. The Department of Commerce concluded that the US relies heavily on foreign sources for critical minerals and faces supply chain vulnerabilities, which threaten to harm national security. Consequently, in accordance with Proclamation 11001 (January 15, 2026), the US will seek to engage in negotiations with its trading partners to address these concerns through various measures, including the establishment of minimum import prices or the application of trade restrictions.

³³ Executive Orders 14154, *Unleashing American Energy*; 14213, *Establishing the National Energy Dominance Council*; 14241, *Immediate Measures to Increase American Mineral Production*; 14285, *Unleashing America's Offshore Critical Minerals and Resources*, among others.

³⁴ <https://dbrs.morningstar.com/research/466604>.

³⁵ Notable among these are the framework agreements reached in 2025 with Australia and Japan, and the MoUs signed with Thailand and Malaysia. Furthermore, during the first Ministerial Meeting on Critical Minerals in February 2026, the US signed 11 new bilateral agreements or MoUs (with Argentina, the Cook Islands, Ecuador, Guinea, Morocco, Paraguay, Peru, the Philippines, the United Arab Emirates and Uzbekistan), which lay the groundwork for nations to collaborate on pricing, stimulate development, close gaps in priority supply chains and expand access to financing.

³⁶ https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/critical-raw-materials-act_en.

³⁷ Between 2021 and 2025, it has signed MoUs on critical minerals with Argentina, Canada, Ukraine, Kazakhstan, Namibia, Chile, the Democratic Republic of the Congo and Zambia, as well as Greenland, Rwanda, Norway, Uzbekistan, Australia, Serbia and South Africa. In the case of MoUs with less developed countries, the EU relies on funding from the Global Gateway initiative.

are planned for the first half of 2026 to increase recycling within the EU of certain critical minerals.

On the other hand, **the governments of countries with advantages in the extraction or processing of critical minerals** have focused on maintaining or expanding this dominance and ensuring that the economic benefits of growing global demand are spread throughout their economies, with the aim of developing downstream industries and moving up the value chains; Australia, Canada and Indonesia are examples of this approach.

Australia's Critical Minerals Strategy³⁸ aims to boost growth in the sector, with the goal of turning the country into a superpower in renewable energy; while **Canada**³⁹ seeks to position the country as a global leader in the responsible, inclusive and sustainable production of critical minerals and secure value chains from mining to manufacturing. Both initiatives emphasise national capacity-building for resource extraction and processing and supporting investment in the industry and infrastructure development, for which they have established various support programmes and financial assistance initiatives⁴⁰. At the same time, they seek to strategically manage foreign investments related to these minerals through mechanisms such as mandatory reporting requirements for certain projects, local value-added requirements for large investments, and the screening of foreign investments and restrictions on investments in state-owned enterprises. Both maintain strategic bilateral partnerships with like-minded partners to build resilient supply chains, and are part of several international initiatives related to critical minerals.

Indonesia does not have an official strategy on critical minerals. However, all mineral resources are subject to the 2009 Mineral and Coal Mining Law, amended in 2020. This law establishes that the government is responsible for managing mineral resources and allows for policies that prioritise national interests, including imposing obligations on mining companies to refine and process minerals domestically. The government, with the objective of consolidating the extractive industry and moving up the value chain, has imposed export restrictions and local content requirements on various commodities, including nickel and coal. Likewise, it has adopted policies to attract foreign investors, including raising the limit on foreign ownership of mining and coal operations tied to the location of those operations.

China, in turn, is pursuing a strategy with the dual objective of securing its supply of minerals – it is the world's largest importer and therefore faces the same challenges as other buyers – and expanding its control over key stages of the value chain surrounding these minerals, since it dominates the refining process for a wide variety of critical minerals.

Since the 1980s, China has recognised the strategic potential of critical minerals, particularly rare earth elements, and has adopted multiple strategies to boost domestic production. The National Mineral Resources Plan (2016–2020) identified four key objectives: promoting exploration, regulating the production of minerals in which China has a comparative advantage, reducing the production of minerals with excess capacity, and ensuring the supply of minerals to strategic emerging industries. Measures employed to achieve these objectives include the following: developing a circular economy in the mining industry, increasing support for exploration activities and promoting overseas investment through the Belt and Road

³⁸ <https://www.industry.gov.au/sites/default/files/2023-06/critical-minerals-strategy-2023-2030.pdf>.

³⁹ <https://www.canada.ca/en/campaign/critical-minerals-in-canada/canadas-critical-minerals-strategy.html>.

⁴⁰ Australia, for example, has the *Critical Minerals Facility* and the *National Reconstruction Fund* to provide loans for defence and renewable energy projects. Canada offers, among other benefits, tax incentives for exploration.

Initiative. More recently, the 2021–2025 plan focuses on developing the capabilities of resource-rich regions, increasing exploration, establishing strategic reserves and safeguarding resources.

To support the extraction of its abundant mineral resources, the country offers state-backed financing, promotes technological progress in mining and sponsors exploration. At the same time, it implements industrial policies to boost the development of intermediate and downstream sectors and often resorts to export restrictions and tariffs to protect its incipient industries. In the cases where it lacks its own mineral resources, in order to ensure the supply, it encourages Chinese companies to take up key positions in mineral provision in other countries, with the help of state-directed investments.

Multilateral agreements on critical minerals

There are several publicly recognised multilateral platforms and initiatives that bring together producing and consuming countries with shared goals regarding the security of supply, sustainability and technological development of critical minerals.

Among the most significant multilateral partnerships is the Minerals Security Partnership (MSP), an international forum co-chaired by the US and the EU that seeks to accelerate the development of critical mineral supply chains in cooperation with industry and other governments, support the financing of strategic projects and encourage investment across the entire value chain. Its partners include Australia, Canada, Estonia, Finland, France, Germany, India, Italy, Japan, Norway, South Korea, Sweden and the United Kingdom. To strengthen partnerships with mineral-producing countries, the MSP Forum was established, comprising Argentina, the Democratic Republic of the Congo, the Dominican Republic, Ecuador, Greenland, Kazakhstan, Mexico, Namibia, Peru, the Philippines, Serbia, Türkiye, Ukraine, Uzbekistan and Zambia.

At the first Ministerial Meeting on Critical Minerals⁴¹, held in February 2026 in Washington, D.C., the launch of the Forum on Resource Geostrategic Engagement (FORGE) was announced; it will replace the MSP. FORGE partners will collaborate at the policy and project levels to advance initiatives that strengthen mineral supply chains.

In addition, the Quad Critical Minerals Initiative operates within the framework of the Quad dialogue – comprising Australia, India, Japan and the United States⁴²–, aimed at strengthening economic security and collective resilience by diversifying supply chains for critical minerals. The G7 has also launched a Critical Minerals Action Plan⁴³ and the Critical Minerals Production Alliance⁴⁴ as part of its agenda to address structural vulnerabilities in global supply chains.

Other initiatives like the Critical Minerals Mapping Initiative⁴⁵, formed by Australia, Canada and the US, are centred on research collaboration among the geological surveys of each country, with the aim of addressing vulnerabilities in global natural resources.

⁴¹ <https://www.state.gov/releases/office-of-the-spokesperson/2026/02/2026-critical-minerals-ministerial/>.

⁴² <https://www.state.gov/the-quad/>.

⁴³ <https://g7.canada.ca/en/news-and-media/news/g7-critical-minerals-action-plan/>.

⁴⁴ <https://www.canada.ca/en/campaign/critical-minerals-in-canada/our-critical-minerals-strategic-partnerships/critical-minerals-production-alliance.html>.

⁴⁵ <https://pubs.usgs.gov/fs/2020/3035/fs20203035.pdf>.

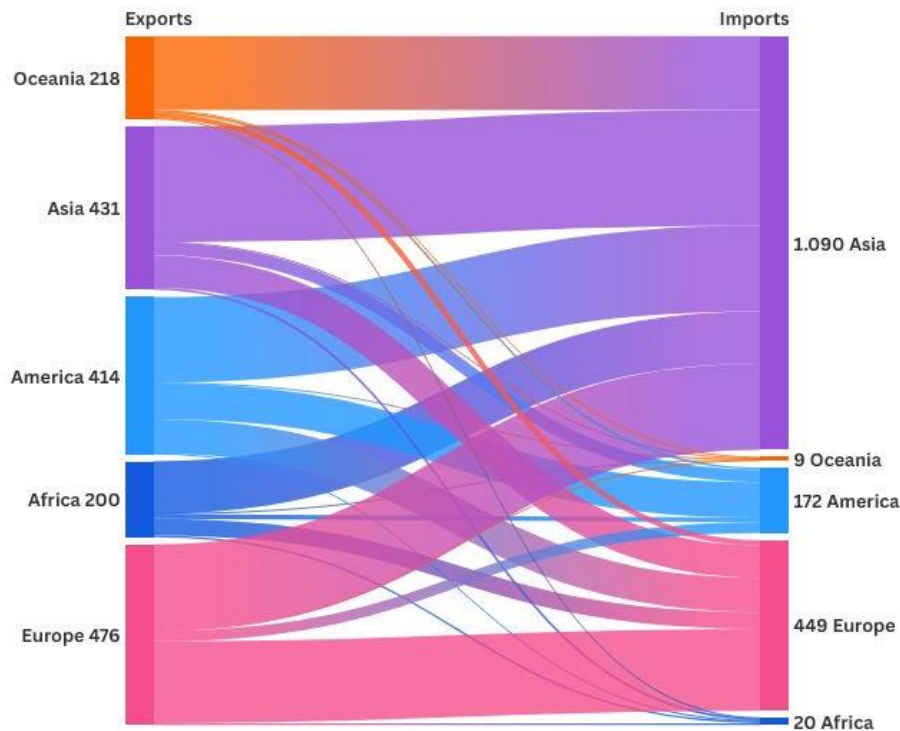
5. International trade and trade restrictions

5.1. Trade flows⁴⁶

Trade in critical minerals has increased significantly over the past 15 years, growing at an average annual rate of more than 7% between 2010 and 2024. In 2024, exports reached USD 1.3 trillion, while imports totalled USD 1.6 trillion⁴⁷.

At the regional level, Asia is the largest market for critical minerals, with imports for USD 1.1 trillion on average between 2022 and 2024 –65% of global imports– and exports for USD 0.4 trillion –28% of total exports–. In contrast, Oceania, America and Africa record significant trade surpluses, while Europe has a more moderate trade deficit (Graph 4). This trade pattern, which has been seen over the last 15 years, highlights the role played by many countries in America, Africa and Oceania as suppliers of critical minerals, while Asia has established itself as a hub for the processing and manufacturing of products that rely heavily on critical minerals as inputs.

Graph 4. International trade in critical/strategic minerals, by continent
Average 2022-2024. In USD billion



Source: DNCEI based on WITS

In particular, China is the world’s largest importer of critical minerals, accounting for over 28% of the global total. Despite being the leading producer of several minerals, it is not always the largest exporter: rather, it depends on the purchases of various inputs, since it dominates

⁴⁶ For the calculation of trade, the list of 90 critical minerals presented in section 4.2 was used. These minerals were assigned, where possible, the corresponding tariff subheading (HS 2017 6-digit code). In this way, 237 subheadings related to some of the critical minerals were identified. No combustible minerals, semi-finished products or derivatives were included. Source of trade data: WITS.

⁴⁷ According to UNCTAD (2025), in 2023 international trade in critical minerals reached imports for USD 2.57 trillion and exports for USD 2.52 trillion, which is equivalent to about 10% of world exports. These figures are taken from a list of 80 critical minerals and 485 tariff subheadings, which include both raw materials and semi-finished products. The main trends and general conclusions are similar to those observed in this section. For more information please see <https://sdgpulse.unctad.org/critical-minerals/>.

much of the intermediate and final production of many critical materials. It is the main buyer of nickel, copper, cobalt and rare earth elements, among many other minerals, and its main suppliers of critical minerals include Australia, Chile, Brazil, South Africa and Canada.

Other relevant importers worldwide are Switzerland, the United States, Japan, India, the United Arab Emirates, Hong Kong (SAR China), South Korea, Germany and Türkiye.

In turn, Australia became the main exporter of minerals globally, mainly to China; it is followed by Japan, South Korea, India and other Asian countries as its main export destinations. The United States, Canada, Hong Kong (SAR China), Chile, the United Arab Emirates, Brazil, China, South Africa, and Peru also stand out as exporters.

At the product level, the leading exporters largely reflect the concentration in production. Notable for their significant share of global exports (over 40%) are the Democratic Republic of the Congo, in terms of cobalt exports; South Africa, in terms of chromium, manganese and certain platinum group metals; and China, in terms of antimony, graphite and magnesium, among others.

5.2. Trade restrictions

One of the factors that significantly influences trade flows relates to trade restrictions. In the case of critical minerals, according to the Global Trade Alert database, between 2009 and 2025, 1,289 **restrictions on imports and exports** of critical minerals⁴⁸ were implemented. Since 2022, there has been a significant increase in the number of measures that have a negative impact on trade in critical minerals, with 45% of all government interventions taking place in the last four years.

Of these measures, 889 were in force at the end of 2025. A total of 61% consists of restrictions on imports of critical minerals and the remaining 39% relate to exports. Among the measures that affect imports, the most commonly used were tariff rises, followed by quantity control measures (bans, licences, quotas, and tariff-rate quotas). Regarding export restrictions, governments made greater use of export bans and licences.

Ten countries are responsible for implementing more than 60% of the measures currently in place, including the US (14% of the total), China and the EU (10% each), India (7%), Indonesia and the United Kingdom (5% each).

The minerals subject to the largest number of restrictive measures are aluminium, copper and nickel, followed by graphite and cobalt, which together account for 60% of all the restrictive measures in force.

In turn, the OECD⁴⁹, in its survey of **restrictions on exports** of industrial raw materials⁵⁰, found that such measures increased fivefold between 2009 and 2024, with a marked acceleration

⁴⁸ Subset of government interventions that restrict exports or imports of 226 tariff subheadings identified as critical minerals, based on a compilation of national lists of this type of minerals. Information downloaded on 10/03/2026 from <https://globaltradealert.org/threads/import-and-export-restrictions-critical-minerals>.

⁴⁹ OECD (2026). *OECD Inventory of Export Restrictions on Industrial Raw Materials 2026: Monitoring the Use of Export Restrictions Amidst Growing Market and Policy Tensions*.

⁵⁰ The OECD inventory covers 65 industrial commodities considered critical or strategic (58 minerals and metals, and 6 wood products, in addition to waste and scrap, equivalent to 489 6-digit products of the 2007 Harmonised System) and presents data from 82 producing countries (which accounted for 97% of mineral and metal production, and 81% of wood production in 2022). The inventory lists measures that restrict (or are suspected of restricting) exports.

between 2022 and 2023, coinciding with the Russian invasion of Ukraine and the rising geopolitical tensions. Export taxes and licences were the most commonly used measures and, at the same time, those that contributed most to the increase in restrictions. Furthermore, the agency has noted a significant rise in export bans, particularly, since 2019.

Waste and scrap materials was the category subject to most restrictions, mainly due to environmental concerns and growing interest in the recycling of critical minerals. There was also a significant increase in export restrictions in the early stages of supply chains, such as minerals and concentrates.

Between 2022 and 2024, 16% of global trade in industrial raw materials (excluding waste and scrap) was affected by at least one restriction. The impact was especially noticeable on the trade in cobalt and manganese (70% of affected trade), graphite (47%), rare earths (45%) and tin (41%).

Some prime examples of the application of export restrictions are those of China with rare earths and Indonesia with nickel.

In the early 2000s, the Chinese government took a series of export-related measures to consolidate control of the **rare earth** industries. Between 2000 and 2005, it decreased and then eliminated export refunds, reduced the number of export licences, introduced export quotas and imposed export duties. Moreover, in a widely known event, China significantly reduced its exports of rare earths to Japan in September 2010 due to a maritime incident between both countries. This set of measures ultimately led to a substantial increase in prices for importers.

In March 2012, the United States, the European Union and Japan jointly initiated WTO dispute settlement proceedings against China's restrictive policies on rare earths and two other minerals⁵¹. Both the Dispute Settlement Panel and, subsequently, the Appellate Body ruled in favour of the complainants, and China eventually lifted its restrictions on rare earth exports in 2015⁵².

Since the adoption of the Export Control Act 2020, the Chinese authorities have gradually established a unified and codified framework for managing sensitive exports, through catalogues of technologies prohibited or restricted for exports and lists of "dual-use" items subject to export controls.

Since 2023, China has begun to apply more targeted controls on specific critical minerals, expanding its scope to cover more stages of the value chain and even to related production technologies. Examples include export licences for gallium and germanium, graphite, antimony, tungsten and tellurium, gadolinium, dysprosium and terbium⁵³.

As a leading country in mining production of **nickel**, **Indonesia** introduced bans on the export of this mineral in 2014, which reduced domestic prices to the benefit of local processing sectors. In addition, it granted companies holding mining licences a five-year grace period to establish local processing activities and created special economic zones to attract foreign capital for the development of transformative sectors. It has thus overtaken China as the main refiner of this mineral and currently concentrates more than half of both the global extraction and refinement of this mineral. It now has a thriving domestic metalworking industry, as well as battery plants and electric vehicle factories. This success has prompted the Indonesian government to expand the approach to other critical minerals, such as bauxite and copper⁵⁴.

⁵¹ Cases DS 431, 432 and 433 at https://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm.

⁵² CRS (2019). *Trade Dispute with China and Rare Earth Elements*.

⁵³ <https://globaltradealert.org/blog/a-short-history-of-chinese-export-controls-on-critical-raw-materials>.

⁵⁴ CEPR (2023). *The Scramble for Critical Raw Materials: Time to Take Stock?*

Regarding the **subsidies** to critical minerals⁵⁵, according to the Global Trade Alert database, in the 2009 and 2025 period, 2,043 measures were registered, 1,851 of which remain in force. The largest number of grants has been awarded in the last four years.

China is, by far, the country that introduced the most subsidies, accounting for almost half of the measures currently in place. It is followed by the United States, with 6.6%, and Canada with 4.0%. Among the measures employed, financial subsidies were the most commonly applied (72.5% of all subsidies in force as of 2025), followed by government loans (16.1%).

The minerals associated with the highest level of subsidies are copper, aluminium, nickel, cobalt, lithium and potassium, which account for 65.8% of all current subsidies on record.

6. Critical minerals in Argentina

Argentina has an interesting geological diversity, with abundant mineral resources spread across various regions. This wealth positions the country as a key player on the global mining map, with the potential to attract investment and drive regional development, particularly with regard to certain critical minerals.

In 2025, the mining sector accounted for 0.8% of the economy's gross value added⁵⁶. Gold and silver are the most relevant minerals in terms of value produced, followed by lithium, lead and zinc. It should be noted that copper was also among the main minerals produced until 2018, the year in which production ceased at the last operational deposit.

Globally, in 2025 Argentina accounted for 7.9% of world lithium production (ranking 5th globally); 5.8% of boron production (6th); 3.1% of silver production (10th); 1.4% of global gold production (among the top 20 major producers); and 0.2% of total strontium production (5th largest world producer)⁵⁷.

The activity is characterised by being predominantly export-oriented. In 2025, the mining sector generated exports worth USD 6.1 billion, a record figure for the activity, accounting for 7% of our country's total goods exports. Likewise, the metalliferous and lithium mining complex ranked fifth among the main exporting complexes of goods⁵⁸. At world level, Argentine exports accounted for 0.3% of global mining exports in 2023⁵⁹.

The volume of mineral resources identified in deposits with the potential to become productive mines places Argentina among the top 15 countries receiving investment in exploration. As it can be seen in Graph 5, between 2019 and 2024 (record year), Argentina's exploration budget more than doubled, placing it among the top three destinations for funding for this purpose in South America, alongside Chile and Peru⁶⁰.

⁵⁵ Domestic subsidies subset (corresponds to chapter L of UNCTAD's classification of non-tariff measures, excluding export subsidies) affecting 226 tariff subheadings identified as critical minerals. Information downloaded on 10/03/2026 from <https://globaltradealert.org/threads/subsidies-critical-minerals>.

⁵⁶ According to Indec data, *Agregados macroeconómicos (PIB)*. The sector includes extraction of metalliferous and non-metalliferous minerals, as well as construction aggregates.

⁵⁷ According to USGS data (2026). *Mineral commodity summaries*. In the case of gold, the information corresponds to the year 2022 (latest data available).

⁵⁸ Indec (2026). *Complejos exportadores. Año 2025*.

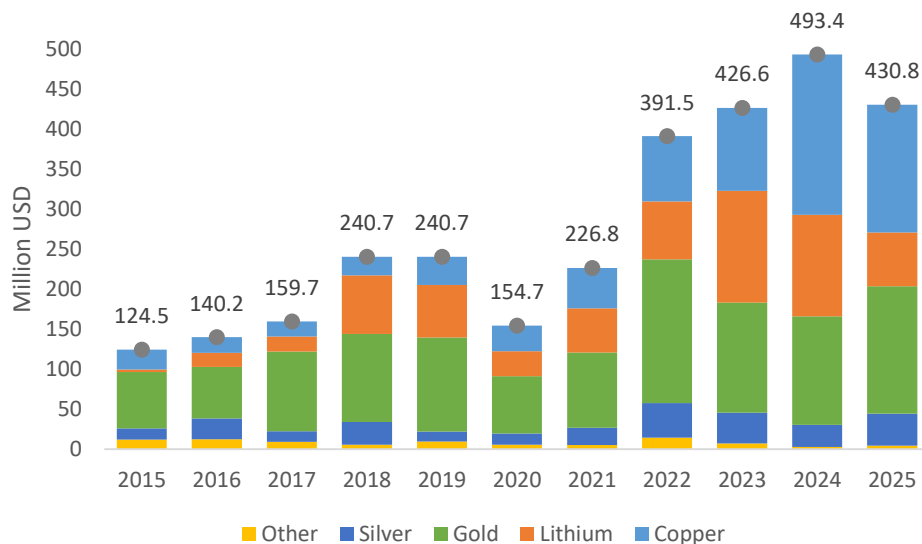
⁵⁹ According to indicators of the Information System Open to the Community on Mining Activity in Argentina (SIACAM, for its acronym in Spanish): *Comercio exterior de Argentina* (data as of 2025) and *Comercio mundial de minerales* (latest data available: 2023).

⁶⁰ SIACAM: *Presupuestos exploratorios*.

In this regard, as of December 2025, there have been 328 metalliferous and lithium compound mining projects distributed across the country (approximately 8% are operational, 81% are in the initial stages of development and 11% are at an advanced stage). In addition to this figure, there are 703 mining projects relating to non-metalliferous minerals and construction aggregates⁶¹.

Graph 5. Evolution of the exploration budget by mineral

In million USD. 2005-2025



Source: DNCEI based on SIACAM data

6.1. What critical minerals can be offered by Argentina?

Of the total minerals considered as critical in any of the lists analysed⁶² (see section 4.2), there is at least one mining project under development in Argentina in 30 cases. Among the minerals in highest demand, lithium and copper offer the greatest relative growth potential for our country.

Regarding **lithium**, Argentina has been consolidating itself as a leading player in the global production of lithium carbonate and hydroxide, making it the world's fifth-largest producer in 2025⁶³. It is estimated that in the next decade it could become the second largest producer worldwide, given the country's existing lithium resources and reserves (19% and 12% of the global total, respectively) and a high exploration budget (USD 67.3 million, 11.3% of the global lithium budget). As of December 2025, 66 projects were underway, including 7 projects already in operation and 14 at an advanced stage. In 2025, Argentine lithium exports reached USD 915 million and are expected to exceed USD 11.0 billion by 2035⁶⁴.

⁶¹ SIACAM: *Cartera de proyectos de minerales metalíferos y litio* and *Cartera de proyectos de minerales no metalíferos y rocas de aplicación*, consulted on 20/02/2026.

⁶² Due to the lack of disaggregated information for Argentina, platinum group minerals were grouped on one side, and rare earth elements on the other. As a result, the total number of critical minerals surveyed in the lists is reduced from 90 to 69.

⁶³ For a more detailed analysis of this mineral see CEI (2025), *La minería de litio en la Argentina. Diagnóstico actual y perspectivas futuras*.

⁶⁴ According to data from SIACAM, USGS (2026) and the Secretariat of Mining (2025). *Litio. Panorama global del mercado del litio y el potencial litífero de Argentina. Serie de estudios sobre mercados mineros*, June.

The outlook for **copper** is equally promising. It is estimated that Argentina has more than 115 million tonnes of resources in copper deposits, while reserves (proven and probable) total 17.1 million tonnes. This is reflected in the increase in the exploration budget in recent years, which rose from USD 32 million in 2020 to more than USD 160 million in 2025 (peaking at USD 200 million in 2024) and has placed our country among the top ten countries with the largest exploration budgets worldwide. There are eight copper projects in advanced stages prior to the start of operations⁶⁵, which are expected to resume large-scale copper production⁶⁶. In addition, there are 67 projects in the initial stages of the mining cycle. According to estimates, advanced projects have the potential to start producing some 5,000 tonnes of copper from 2028, to reach its peak of 1.5 million tonnes in 2035. On the other hand, exports projected for 2030 could exceed USD 5.0 billion and reach a maximum of USD 17.7 billion five years later⁶⁷.

In addition to lithium and copper, among the most demanded critical minerals (those appearing in at least half of the lists analysed), others for which our country has mining projects are the following: rare earths, nickel, graphite, niobium, tungsten, antimony, manganese, tin, fluorite, zinc and iron (Graph 6).

It should be noted that Argentina has historically been a producer of **zinc**, although production of the metal is on the decline. In 2024, 5,700 tonnes⁶⁸ were produced, and about USD 10 million were exported in 2025. However, there is a project in the initial exploration stage that has it as its main mineral, in addition to numerous ones that will obtain it as a by-product. Resources are estimated at 2.3 million tonnes.

Likewise, Argentina produced **manganese** in the past, but there are currently no mines in operation. The country has resources amounting to 440,000 tonnes, with 7 mining projects currently at the exploration or prospecting stage, primarily aimed at extracting manganese⁶⁹.

As regards **rare earth elements**, there is no local production. The only significant industrial precedent was the Teodesia mine, located in San Juan, which in the 1950s extracted barely one tonne of monazite⁷⁰. Although the resources identified in Argentina amount to 190,000 tonnes, it is estimated that the potential resources could exceed three million tonnes⁷¹. To date, there are 4 mining projects in the initial exploration stage.

⁶⁵ These include the Vicuña project, whose total investment is estimated at USD 18.0 billion over 10 years. Vicuña integrates the Josemaría and Filo del Sol deposits in San Juan and will produce copper, gold and silver.

⁶⁶ Currently Martín Bronce, located in the province of Jujuy; it produces copper on a small scale.

⁶⁷ Secretariat of Mining (2026). *Mercado del cobre. Panorama internacional y perspectivas productivas para Argentina*. February.

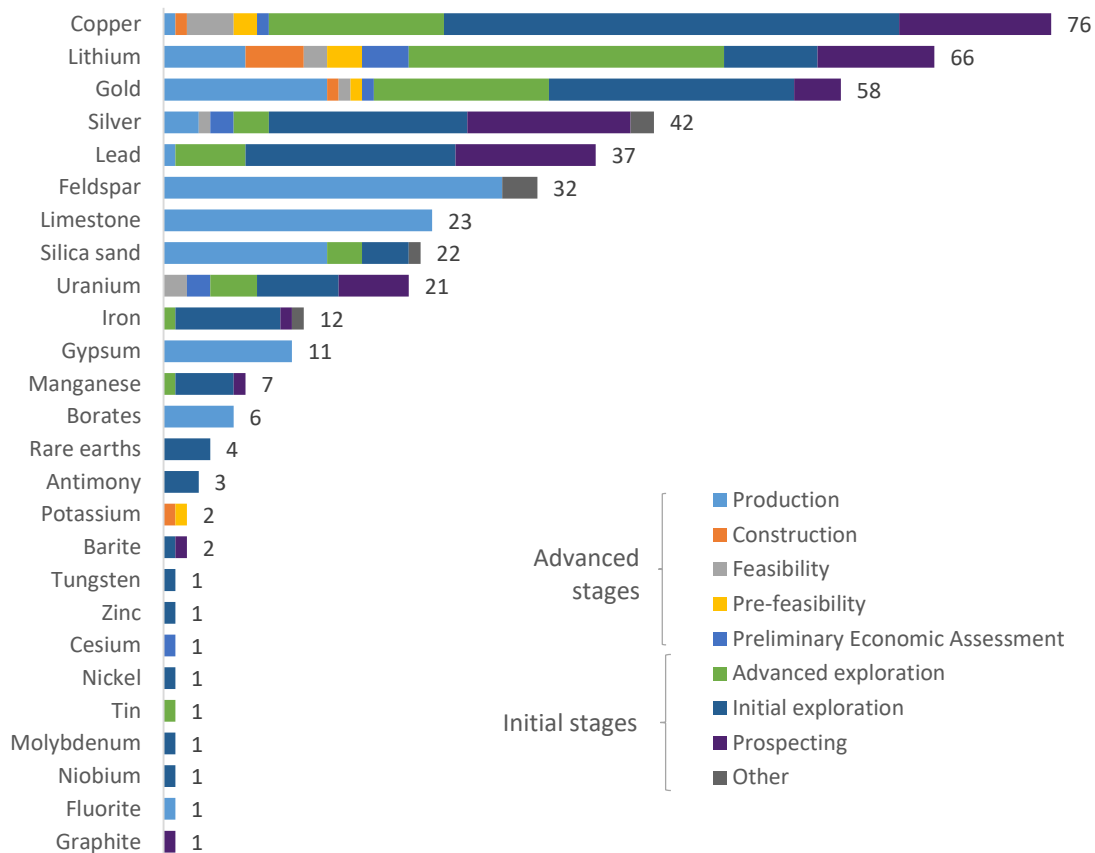
⁶⁸ Secretariat of Mining (2025). *Compendio estadístico de la actividad minera metalífera y compuestos de litio*. Serie de estudios estadísticos, November.

⁶⁹ Secretariat of Mining (2025). *Manganeso*. Serie de estudios sobre mercados mineros, March.

⁷⁰ Monazite is one of the rare earth-bearing minerals.

⁷¹ Zappettini (2022). *Elementos de las tierras raras. Panorama general y evaluación del potencial en la República Argentina*. Instituto de Geología y Recursos Minerales. SEGEMAR, Serie Contribuciones Técnicas. Recursos Minerales N° 48.

Graph 6. Argentina. Selected metalliferous and non-metalliferous projects
By stage of development and main mineral. 2025



Source: DNCEI based on SIACAM data

As for the materials considered critical by a smaller number of countries (less than half of those surveyed), our country has potential mainly in gold and silver. At least one mining project is also registered for the extraction of molybdenum, potassium, boron, barite, caesium, feldspar, silica, aggregates, limestone and gypsum.

With regard to **gold**, Argentina has significant potential, as reflected in its auriferous resources and reserves; the latter account for 1.6% of global reserves. In 2025, exports of this metal totalled USD 4.1 billion, which makes it the main mineral exported by our country. In addition, there are 14 mining projects currently in operation, 4 in advanced stages and 40 in initial phases, all of which have this mineral as their primary target mineral. In the short and medium term, gold production is expected to lose momentum, since it relies, in part, on mature auriferous projects. However, it is expected to be revitalised by other major non-auriferous projects linked to copper production, where gold is extracted as a secondary mineral⁷².

Silver was included as a critical mineral in the latest US list. Argentina was the 10th largest silver producer in 2025, with 3.1% of global production. It has three projects in production, where silver is the main mineral. There are also three others at advanced stages and more than 30 in initial phases. In 2025, silver exports amounted to USD 785 million and external

⁷² Secretariat of Mining (2025). *Mercado de oro. Activo de inversión estratégico. Panorama mundial y local*. October.

sales are projected to reach their maximum by 2032, for a total of USD 855 million, driven by projects where this mineral is obtained as a by-product⁷³.

Molybdenum is generally a by-product of copper mining. Argentina has not reported production figures in recent years, but its reserves place it among the top ten countries worldwide. The Secretariat of Mining's portfolio of mining projects includes one project in which molybdenum is the primary mineral to be exploited, and several others in which it plays a secondary productive role, although none are in the production stage yet⁷⁴.

In turn, the Aguilar mine in Jujuy is, to date, the only one that produces **lead** as a primary mineral (there are three other mines where it is extracted as a secondary or tertiary commodity). About 40,000 tonnes were produced in 2024⁷⁵ and in 2025 exports were worth USD 52 million. Argentina has the potential to strengthen its position in the international market, through its portfolio of projects at various stages of production that aim to exploit this mineral as a primary commodity (36 projects) or as a secondary material (in gold, silver and copper exploitation projects)⁷⁶.

Prominent non-metalliferous minerals include **boron** and **feldspar**. In the first case, Argentina is the sixth largest producer in the world with an output of 170,000 tonnes, exports worth USD 83 million in 2025, and six active projects. As for **feldspar**, there are 29 projects in operation and exports amount to nearly USD 1 million.

A special mention should be made of **uranium**, a mineral that has unique characteristics due to its dual use in both nuclear power generation and the military sector. Argentina has a complete uranium cycle, from its extraction to its conversion and enrichment, which gives it a strategic advantage in the international context. Although uranium production in the country ceased at the end of the 20th century, significant resources (34,250 tonnes of identified recoverable resources) are available in provinces such as Chubut, Mendoza, Río Negro and Salta. As of December 2025, there are 21 projects that list it as their main commodity, four of which are at advanced stages of development⁷⁷.

Finally, the Ministry of Economy⁷⁸ identified among the ten key minerals for the energy transition –in addition to copper, rare earths, graphite, lithium, manganese, nickel and zinc–, **cobalt** and **chromium**, which are not produced in the country, but for which resources are available⁷⁹. In the case of the **platinum** group metals, deposits are believed to exist, but the resources are still undetermined. In none of the three cases is there information available regarding the progress of projects related to their exploitation.

6.2 The Argentine legal framework

The Argentine legal framework is based on three fundamental pillars: the National Constitution, the Mining Code and the Mining Investment Law. The National Constitution

⁷³ Secretariat of Mining (2024). *Mercado de plata*. November.

⁷⁴ Secretariat of Mining (2025). *Molibdeno*. Serie de estudios sobre mercados mineros, January.

⁷⁵ Secretariat of Mining (2025). *Compendio estadístico de la actividad minera metalífera y compuestos de litio*. Serie de estudios estadísticos, November.

⁷⁶ Secretariat of Mining (2025). *Plomo*. Serie de estudios sobre mercados mineros, January.

⁷⁷ Secretariat of Mining (2026). *Uranio en Argentina*. Serie de estudios sobre mercados mineros, March.

⁷⁸ Secretariat of Economy (2026). *Key minerals for the energy transition*.

⁷⁹ For further information on these two minerals, please refer to Serie de estudios sobre mercados mineros published by the Secretariat of Mining: *Cobalto* (March 2025) and *Cromo* (April 2025).

establishes the federal nature of the system and provides, in article 124, that the original ownership of natural resources corresponds to the provinces, which gives them a central role in the administration, control and development of mining activity within their territories, and also helps explain the dynamism of the activity in certain jurisdictions.

In turn, the Mining Code promotes openness to the private sector and allows individuals or legal entities to acquire ownership of mining rights through concessions granted by the competent authority. Finally, the Mining Investment Law aims to encourage private investment, by offering tax stability and benefits that reduce investment costs, especially during the first years of operation. These benefits include the deduction of prospecting and exploration expenses, accelerated amortisation of investments and tax exemptions for the import of capital goods, equipment and specific inputs. Furthermore, the law sets a 3% cap to provincial royalties, calculated on the mine mouth value.

In addition, the Incentive Regime for Large Investments (RIGI, for its acronym in Spanish), which came to force in August 2024, stands as one of the most relevant tools for attracting international capital to large-scale projects (investments of more than USD 200 million), in strategic sectors, including mining. The RIGI offers fiscal and exchange stability for 30 years, free availability of foreign currency and a simplified customs and tax regime, reducing uncertainty and strengthening competitiveness compared with other investment destinations. In February 2026, the deadline for joining the scheme was extended by one year, and the option was introduced to include projects for the exploitation and production of new onshore liquid and gaseous hydrocarbon developments.

The agreements and MoUs signed by Argentina with France⁸⁰, Canada⁸¹, the United Arab Emirates⁸², the European Union⁸³ and the United States⁸⁴ represent a crucial milestone in promoting the development of critical minerals in the country. These strategic commitments open up new opportunities for technological, financial and trade cooperation, which could accelerate the exploration and exploitation of key resources. In particular, given the growing demand for minerals critical to the energy transition and the manufacture of advanced technologies, these agreements have the potential to strengthen Argentina's position as a global supplier of essential minerals, while fostering the development of local infrastructure and capabilities in the sector. In addition, our country is a member of the Mineral Safety Partnership (MSP).

Definitions of critical and strategic minerals

Although our country does not have a list of critical minerals, the Mining Code establishes that the National Executive Power will classify strategic mineral substances, in accordance with the provisions of Article 354: "The National Executive Power, upon a joint proposal of the Ministries of Defence and of

⁸⁰ <https://www.argentina.gob.ar/noticias/economia-firmo-declaracion-de-intencion-con-francia-por-minerales-criticos>.

⁸¹ <https://www.argentina.gob.ar/noticias/economia-firmo-un-acuerdo-sobre-minerales-criticos-con-el-ministerio-de-recursos-naturales>.

⁸² <https://www.investuae.gov.ae/en/media/uae-and-argentina-sign-investment-memorandum-to-strengthen-minerals-sector-cooperation>.

⁸³ https://single-market-economy.ec.europa.eu/publications/memorandum-understanding-eu-argentina-sustainable-raw-materials_en.

⁸⁴ <https://www.cancilleria.gob.ar/es/actualidad/noticias/argentina-y-estados-unidos-suscribieron-un-memorandum-sobre-cooperacion-en> y <https://cancilleria.gob.ar/es/actualidad/noticias/argentina-y-estados-unidos-suscribieron-un-acuerdo-de-minerales-criticos>.

Economy and Public Works and Services, and in consultation with the senior authorities of the Armed Forces, shall periodically classify strategic mineral substances, for the purposes set out in this Code.”

In this regard, in 2022, the National Secretariat of Mining, the Argentine Geological Mining Service and the Federal Mining Council⁸⁵ proposed the following classification:

- **Critical minerals:** These are those for which the risk of supply shortages and, consequently, their resulting impact on the economy is much greater than for any other raw material. Minerals are considered critical if they do not exist in the country or if, even where known deposits exist, it is not possible to extract them profitably, or their production does not meet domestic demand, and must be sourced from abroad.

Aluminium, for example, could be considered a critical mineral because if imports were cut off, the related industry would grind to a halt; the same applies to phosphorus, a shortage of which would bring agricultural production to a virtual standstill.

- **Strategic minerals:** These are all those minerals that are used in industry for their particular intrinsic properties, and their reserves are highly sought after by industrialised countries. Within this group, **minerals of strategic economic importance** are those whose exploration and subsequent exportable production act as a major driver of the local, regional and national economy through the generation of jobs, the development of goods and services suppliers, contributions to the treasury in the form of taxes and royalties, and the inflow of foreign exchange.

According to this definition, some minerals of strategic economic importance for Argentina would include gold, silver, lithium, zinc, lead, copper. For many of these minerals, there is no national industry that uses them as an input. On the other hand, the country is self-sufficient in minerals such as quartz, feldspar, carbonates, clays, salt, sand for fracking, which form part of Argentina’s industrial development, add value and produce exportable manufactured goods.

7. Conclusions

The digital transformation of the economy, the deployment of renewable energies and the development of advanced technologies have intensified the reliance on a wide range of minerals, whose demand will continue to expand in the coming decades. However, this increase in demand contrasts with a supply that faces multiple structural constraints, which generates potential imbalances and disruptions in global supply chains.

In an international landscape marked by geopolitical tensions and competition to lead the technological race, ensuring stable access to these resources has become a strategic priority for many economies, which are increasingly incorporating them into their economic and national security agendas.

In this scenario, opportunities arise for those countries with significant mineral resources. The existence of reserves that have not yet been fully exploited, coupled with the prospect of sustained demand in the long term, opens up a window of opportunity to diversify global supply and reduce current concentration levels. However, the mere availability of resources does not guarantee economic benefits. It is necessary to support the development of the sector with policies that promote investment, innovation, environmental sustainability and integration into higher value-added links.

For Argentina in particular, the current international context poses a significant challenge. Our country’s mineral wealth and its potential to attract investment provide it with the opportunity

⁸⁵https://www.argentina.gob.ar/sites/default/files/20220818_definiciones_de_minerales_criticos_estrategicos_y_d_e_importancia_economica_estrategica_smn-cofemin-segemar.pdf.

to position itself as a key supplier in an expanding global market, particularly with regard to certain critical minerals. Among them, lithium stands out –Argentina is already the world’s fifth-largest producer and is set to continue growing– as does copper –which is on track to be produced on a large scale and exported, thanks to projects that are already at an advanced stage–. In addition to the traditional gold and silver production, there is also a varied portfolio of investment projects, in various stages of progress, involving critical minerals in high demand such as zinc, manganese, nickel, graphite, niobium, tungsten, antimony, tin, fluorite, iron and rare earths.

Annex. Lists of critical and strategic minerals

País	Last listing year	Denomination	Mineral quantity ¹	Link
United States	2025	Critical minerals	60	https://www.usgs.gov/programs/mineral-resources-program/science/about-2025-list-critical-minerals#overview
European Union	2023	Critical raw materials Strategic raw materials	34 16	https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en#fifth-list-2023-of-critical-raw-materials-for-the-eu
Canada	2024	Critical minerals	34	https://www.canada.ca/en/campaign/critical-minerals-in-canada/critical-minerals-an-opportunity-for-canada.html
Australia	2024	Critical minerals Strategic materials	31 5	https://www.industry.gov.au/publications/australias-critical-minerals-list-and-strategic-materials-list
United Kingdom	2024	Critical minerals	34	https://www.bgs.ac.uk/news/uk-2024-criticality-assessment/
South Korea	2023	Critical minerals Strategic critical materials	33 10	https://www.iea.org/policies/17943-critical-mineral-list-in-korea
Japan	2020	Rare metals	35*	https://www.iea.org/policies/16639-international-resource-strategy-national-stockpiling-system
New Zealand	2025	Critical minerals	37	https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/minerals-and-petroleum/critical-minerals-list/critical-minerals-list-2025
South Africa	2025	Critical minerals	21	https://www.gov.za/sites/default/files/gcis_document/202505/critical-minerals-and-metals-strategy-south-africa-2025.pdf
India	2023	Critical minerals	30	https://mines.gov.in/admin/storage/app/uploads/649d4212cceb01688027666.pdf
Brazil	2021	Strategic minerals	24	https://www.gov.br/mme/pt-br/assuntos/secretarias/geologia-mineracao-e-transformacao-mineral/pro-minerais-estrategicos/ctapme-2/resolucao-no-02.pdf
Colombia	2023	Strategic minerals	17	https://mineriaencolombia.anm.gov.co/sites/default/files/docupromocion/Resoluci%C3%B3n%20ANM%201006%20de%2030%20noviembre%20de%202023.pdf
Indonesia	2023	Critical minerals	46	https://jdih.esdm.go.id/dokumen/view?id=2400
Malaysia	2021	Strategic minerals	5	https://www.nimp2030.gov.my/nimp2030/modules_resources/bookshelf/e-14-Sectoral_NIMP-Mineral_Industry/e-14-Sectoral_NIMP-Mineral_Industry.pdf
Nigeria	2020	Strategic minerals	8	https://www.iea.org/policies/16799-strategic-minerals-list
DR Congo	2018	Strategic minerals	4	https://cami.cd/textes-principaux/
China	2016	Strategic minerals	24	https://www.iea.org/policies/15519-national-plan-for-mineral-resources-2016-2020

Notes: ¹ According to the official list.

*In 2024 uranium was added to the list.

CRITICAL MINERALS

GLOBAL OVERVIEW AND THE SITUATION IN ARGENTINA

THE OPINION EXPRESSED IN THIS PUBLICATION DOES NOT NECESSARILY REFLECT THE VIEWS OF
THE MINISTRY OF FOREIGN AFFAIRS, INTERNATIONAL TRADE AND WORSHIP OF ARGENTINA.

HYPERLINKS TO OTHER WEBSITES ARE MERELY INFORMATIVE AND DO NOT IMPLY
RESPONSIBILITY FOR OR APPROVAL OF THEIR CONTENT ON THE PART OF THE CEI.

CLOSING DATE: 4 MAY 2026



Ministry of Foreign Affairs,
International Trade and Worship
Argentine Republic