INNOVACIÓN PARA EL DESARROLLO

Iván Duque Center for Prosperity and Freedom

Securing Latin America's future in the new clean energy economy

Contents

Executive Summary

- Securing a relevant position in a low-emission economic future has become an increasing priority for policymakers, as reflected in the various plans and programs announced worldwide. However, there remains a considerable gap between commitments and implementation—one marked by the differing stages of economic and institutional development across countries.

- Clean energy opens a wide range of opportunities to reduce dependence and concentration within the energy market while complementing the sustainable growth vision that guides today's economic system. Yet, challenges persist, and if not addressed, they could limit its potential and widen regional development gaps.

- According to the IEA, clean energy is being integrated into the global energy system at an unprecedented pace, as evidenced by the addition of more than 560 gigawatts (GW) of new renewable generation capacity in 2023. It is projected that renewable energy capacity will be sufficient to meet the expected increase in global electricity demand by 2030 and to reduce coal-based generation.

- China accounted for 60% of this increase in 2023, and by the early 2030s, its solar photovoltaic generation alone is expected to surpass the current electricity demand of the United States.

- In aggregate terms, clean energy is expected to meet virtually all energy demand growth between 2023 and 2035 under the Stated Policies Scenario (STEPS)—considered the most conservative projection.

- These trends could accelerate if current imbalances are corrected through greater coordination and cooperation among countries. For instance, the share of clean energy investment in emerging and developing economies—excluding China—remains stagnant at around 15% of the global total, even though these economies represent two-thirds of the world's population, one-third of global GDP, and will record the highest growth rates over the next decade.

- High capital costs, limited long-term financing, and macroeconomic fragility in several emerging markets continue to hinder progress in the energy transition. In addition, there is a pressing need for a clear vision that actively engages the private sector and creates a favorable investment climate. This context underscores the urgency of long-term economic planning, supported by stronger regional coordination and cooperation.

- Given the growing need to diversify critical mineral supply chains, a window of opportunity is opening for developing countries to address their domestic challenges and shift from their historical role as exporters of raw materials toward greater leadership in value-added production, through refining and manufacturing linked to this industry.

- The global energy transition relies on a strong foundation of strategic minerals, whose production will need to increase significantly in the coming years to meet net-zero commitments and ensure energy security. Elements such as lithium, nickel, cobalt, copper, graphite, and rare earths are essential for manufacturing batteries, wind turbines, solar panels, and electric vehicles.

- As demand for these minerals grows at a rapid pace, their extraction and processing remain highly concentrated in a few countries—often far more so than traditional hydrocarbons. The top three producers account for around 80% of global lithium, cobalt, and rare earth production, and nearly 60% of nickel output.

- At the same time, the geographic concentration of refined products has increased in recent years for nearly all critical minerals, particularly cobalt, lithium, graphite, and rare earths. Between 2020 and 2024, China's dominance expanded across most key minerals. Looking ahead to 2035, the average market share of the three main refined-material suppliers is expected to decline only marginally—to about 82%, returning to 2020 concentration levels.

Executive Summary

- This reality raises significant concerns: any geopolitical, economic, or environmental disruption in these production hubs could disrupt supply chains, increase costs, and slow technological progress. However, it also highlights the opportunity—and the imperative—to bring more players into the process to meet growing demand within a more competitive and resilient ecosystem.

- In this context, regions rich in natural resources and with strong geographical advantages—such as Latin America—emerge as potential actors to diversify supply and strengthen the resilience of global value chains.

- Latin America's vast reserves make it a natural partner in this diversification strategy. However, success will require clear regulatory frameworks and foreign direct investment policies that promote not only extraction but also processing and value creation.

- Both traditional powers and emerging economies such as China and ASEAN have strong incentives to deepen their engagement with Latin America. For the former, the region represents a path to reduce vulnerabilities and enhance resilience in their clean industries; for the latter, it offers a means to secure stable mineral flows, address major climate challenges, and strengthen manufacturing capacities through expanded value chains and access to new markets.

- To fully capitalize on these advantages and gain prominence in this market, Latin America must address its structural challenges and design a forward-looking vision supported by robust institutional frameworks.

- Diversification will not materialize through market forces alone—it requires well-designed policies and strategic alliances.

- Latinoamérica puede aspirar a convertirse a global model in climate action, steering its economies toward a net-zero pathway, thanks to its historically clean energy mix—driven by hydropower and widespread biofuel use in transport—and its growing capacity to integrate other renewable sources such as onshore wind and solar power. The region also holds promise as a source of offshore wind energy and green hydrogen.

- Critical minerals not only underpin the energy transition but have also become strategic inputs for high-value industries such as artificial intelligence, robotics, advanced electronics, defense, and aerospace. The rising demand for these resources means that economies capable of producing, refining, and transforming them will play a central role in the new technological geopolitics. In a scenario where multiple sectors compete for critical minerals and the need to expand supply sources intensifies, Latin America offers unique opportunities.

Introduction

The energy transition toward 2050 is redefining the global economic and geopolitical architecture. The accelerated expansion of renewable energies, driven by climate urgency and the pursuit of strategic autonomy, is generating new balances of power and competition among countries and regions.

Today, China clearly leads investment and technological development in clean energy, consolidating itself as a central actor in the global value chain. At the same time, advanced economies seek to strengthen their energy security and meet the commitments made at COP28 without sacrificing industrial competitiveness. In contrast, several developing economies—despite possessing abundant resources—face financial and governance constraints that limit their capacity to attract large-scale investments for the development of these projects. However, the landscape is also heterogeneous within this group. On one hand, we find Southeast Asian countries or India, which are taking advantage of these changes to consolidate their economic growth by actively participating in energy and technology value chains. Further behind are Africa and Latin America, with low regional integration that limits their representation, coupled with scarce long-term economic planning.

Another key factor adds to this dynamic: the concentration of critical minerals. The energy transition depends on supply chains where a few countries exert significant control—from extraction to processing. This creates uncertainty about the speed, market conditions, and even the geopolitical considerations required to ensure secure and reliable access to these technologies. In this context, Latin America emerges as a strategic region due to its endowment of lithium, copper, and other essential minerals. The region must implement clear measures to capture added value beyond mere resource extraction, which in turn would contribute to diversifying actors and allow it to become a strategic ally for global energy security.

This report seeks to address these challenges and opportunities through a comprehensive lens. The first chapter analyzes how the global energy map is changing and what implications this has for developed and emerging countries. The second chapter examines the concentration of critical minerals and the potential role of Latin America in diversifying supply. Finally, the third chapter proposes a strategic roadmap for the region to increase its prominence in terms of capital, production, and energy and economic security.

1. Transformation of the Global Energy Landscape

Behind the global figures lie heterogeneous regional dynamics. The evolution of energy demand stems from distinct realities in each context and must respond to variables such as population growth and the economic, political, and regulatory conditions of each country. Securing a relevant position within a low-emission economic future has become an increasing priority for policymakers, as reflected in the various plans and programs announced worldwide. However, there remains a considerable gap between announcements and implementation, explained by the different stages of economic and institutional development across countries. At the same time, geopolitical tensions add another layer of complexity, shaping how each region advances in its transition toward more sustainable energy systems.

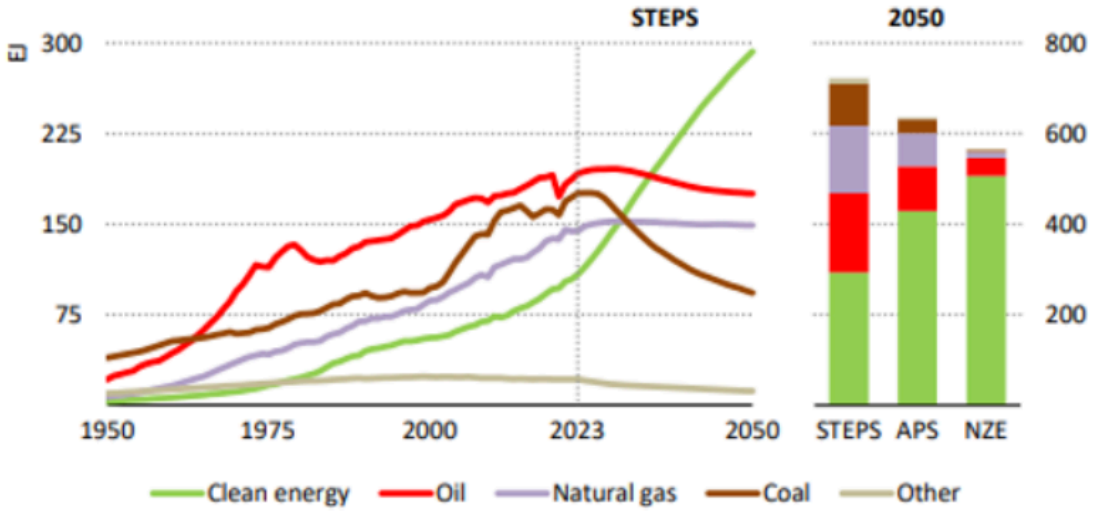
Advanced economies face the need to reduce their energy dependence, lower and stabilize energy costs, and enhance competitiveness in the manufacturing of new technologies, while maintaining their economic leadership. These factors will determine the pace at which these countries achieve decarbonization. Similarly, large developing economies that remain heavily dependent on fossil fuel imports are beginning to shift their demand patterns—movements that are reshaping the global energy map. The magnitude of this shift will depend on the geographic spread of investment flows. While clean energy opens a range of opportunities to transform the energy market and complements the vision of sustainable growth guiding today's global economy, there are challenges that, if left unaddressed, could limit its potential and deepen regional development gaps.

Diversifying energy generation sources means expanding competition within a market long dominated by oil, gas, and coal—fuels that have supported global economic growth but left a significant environmental footprint and exposed economies to geopolitical shocks with major price implications. Although renewables will displace part of the demand for these fuels, they will not eliminate it entirely, particularly in growing economies. These shifts, however, improve market conditions, create room for flexibility, and allow new industries to emerge—facilitating the path toward sustainable development. To achieve this, it will be necessary to build the foundations for a fair and balanced energy transition in the long term.

According to the IEA[1], lean energy is being integrated into the global energy system at an unprecedented pace, as evidenced by the addition of more than 560 gigawatts (GW) of new renewable generation capacity in 2023. Investment in clean energy projects continues to rise, while technology costs have resumed their downward trend after the COVID-19 pandemic disrupted global supply chains. As a result, renewable energy generation capacity is expected to be sufficient to meet the projected increase in global electricity demand by 2030 and reduce coal-based power generation—although these advances will still fall short of meeting COP28 goals.

[1]International Energy Agency. World Energy Outlook 2024.

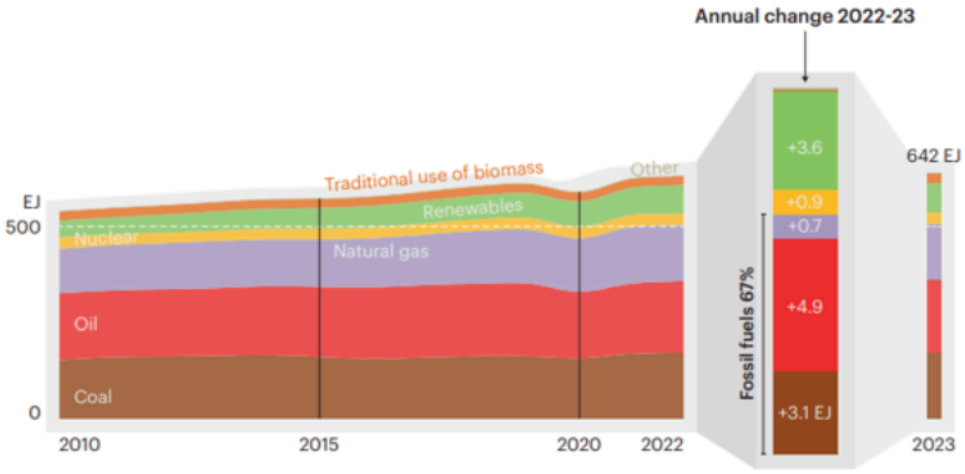
Global energy matrix by scenario, 2050



Source: International Energy Agency. World Energy Outlook 2024

Notes: EJ = exajoules; STEPS = Stated Policies Scenario; APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario. Oil, coal, and natural gas refer to both unabated and non-energy uses. Clean energy includes renewables, modern bioenergy, nuclear power, abated fossil fuels, low-emission hydrogen, and hydrogen-based fuels. The "Other" category includes traditional biomass use and non-renewable waste.

Global energy demand



Source: International Energy Agency. World Energy Outlook 2024

It is also noted that China accounted for 60% of this increase in 2023, and by the early 2030s, its solar photovoltaic generation alone is expected to exceed the current electricity demand of the United States. Historically, the Asian giant has exerted strong influence on global energy markets as a major importer of fuels in line with its industrial expansion.

Yet emerging trends indicate that China will be a decisive player in a future economy driven by clean energy deployment. China accounts for more than 40% of global installed wind and solar PV capacity and over half of the world's electric vehicles. In manufacturing, it represents over 80% of global production of solar modules and EV battery cells. This manufacturing strength will not only allow it to adapt its own energy demand patterns but also expand its global influence across these value chains—steering its economy toward carbon neutrality by 2060.

Similarly, higher energy demand is expected across developing regions, consistent with their growth trajectories—particularly in Latin America, India, ASEAN, the Middle East, and Africa. In some scenarios, this new demand could be offset by the rapid expansion of clean energy.

India, for instance, though it will continue to rely on coal and oil, expects 50% of its generation capacity to come from non-fossil sources by 2030, with a notable rise in solar and wind power. In Southeast Asia, dependence on coal will increase in the short term, yet clean energy generation capacity and the use of natural gas will also expand. Countries such as Malaysia, Thailand, Indonesia, and Vietnam aim to gradually phase out coal from their energy mix. In the Middle East—another region traditionally dependent on fossil fuels—energy demand will increasingly shift toward natural gas, followed by solar and wind. For Africa and Latin America, under IEA projections[2], changes in energy composition appear less pronounced. In Africa, beyond oil and gas, coal and biomass remain prominent, though renewables are expected to modestly displace coal by 2050. Meanwhile, in Latin America, while solar and wind capacity is projected to reach levels comparable to hydropower, oil and gas will remain dominant over the next two decades.

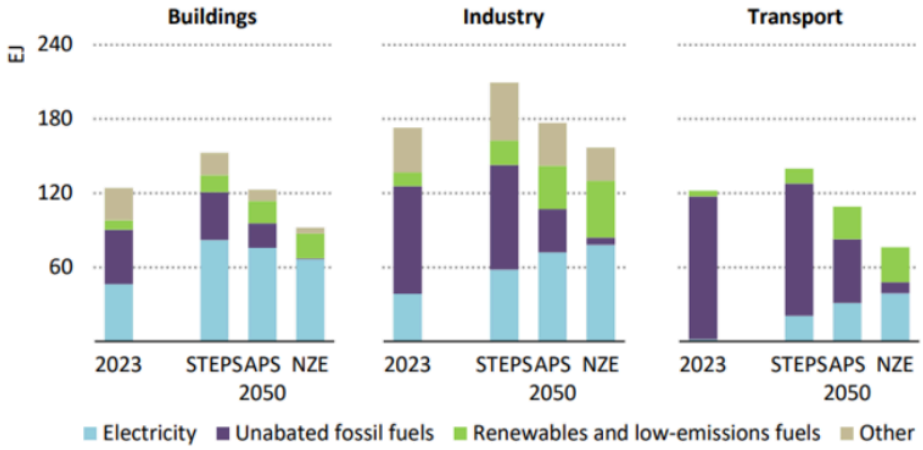
Advanced economies, by contrast, will experience declining overall energy demand and a significant increase in clean energy use. In the United States, total energy demand is projected to follow a downward trajectory through 2050 under the STEPS scenario. However, electricity demand will grow and be fully met by renewables—led by solar PV and wind—which will displace a substantial share of coal and gas-based generation. This increase is driven by the electrification of transport and industry, the rapid expansion of data centers, and higher cooling needs in a warming climate. In the European Union, oil demand is projected to decline by 15% by 2030, natural gas by around 10%, and coal by nearly half. The share of renewables in electricity generation is expected to rise from 45% today to 80% by 2035, largely driven by the strong adoption of electric vehicles. Japan and South Korea—both with advanced nuclear generation capabilities—maintain high industrial energy demand, though total energy use is projected to fall by 2050 as populations decline and efficiency improves.

Much of these changes stem from increased electrification across sectors—a demand expected to be sustained primarily by renewables.

[2]Energy demand in the Stated Policies Scenario (STEPS).

This acceleration will be driven by industrial consumption, electric mobility, air conditioning use, data centers, and AI. While the latter could become a new engine of growth, its forecast remains provisional and uncertain. Consequently, electricity demand from data centers is expected to rise over the next decade, though its magnitude will depend on technological progress in computing equipment and hardware (IEA, 2024).

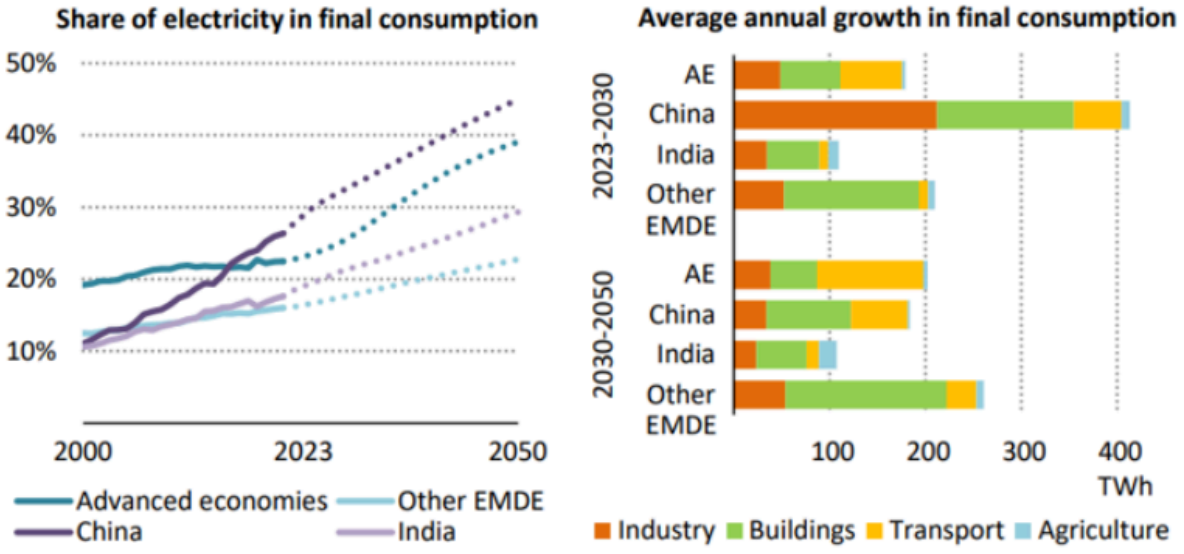
Total final consumption by energy source and sector, 2023 and 2025



Source: International Energy Agency. World Energy Outlook 2024

Notes: EJ = exajoules. "Other" in buildings includes district heating, traditional biomass use, and non-renewable waste. "Other" in industry includes district heating, non-energy use of fossil fuels, and non-renewable waste. Low-emission fuels include modern bioenergy, fossil fuels with carbon capture, utilization, and storage (CCUS) in industry, hydrogen, and hydrogen-based fuels.

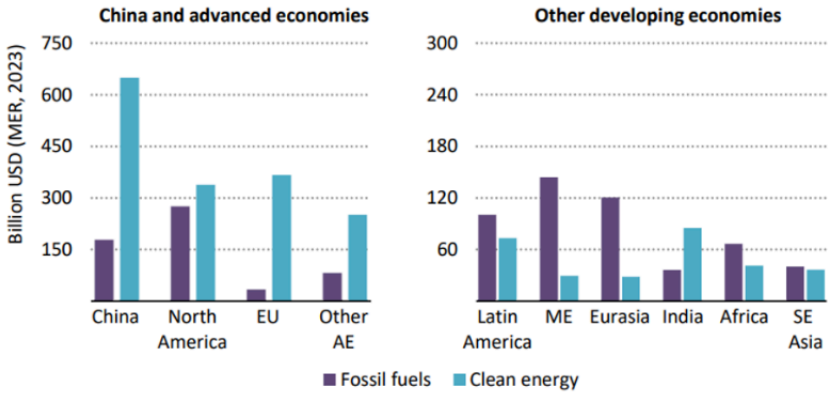
La electricidad en el consumo final total y el crecimiento de la demanda, STEPS hacia 2025



Source: International Energy Agency. World Energy Outlook 2024
Notes: TWh = terawatt-hours; AE = advanced economies; Other EMDE = emerging market and developing economies excluding China and India.

As we can see, trends vary widely across regions, reflecting different population dynamics, industrial growth, climate goals, investment flows, and geopolitical risks. Overall, clean energy is expected to account for virtually all energy demand growth between 2023 and 2035 under the STEPS scenario—the most conservative outlook[3]. Of course, these trends could accelerate if current imbalances are corrected through greater coordination and cooperation among countries. For instance, the share of clean energy investment in emerging and developing economies (excluding China) remains stagnant at 15% of the global total, despite these countries representing two-thirds of the world's population, one-third of global GDP, and the highest economic growth rates projected for the next decade.

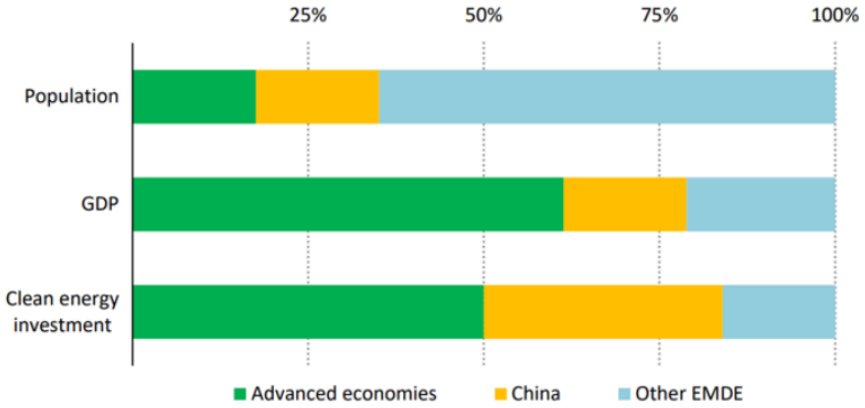
Estimated energy investment by type and region, 2024



Source: International Energy Agency. World Energy Outlook 2024

Notes: EU = European Union; Other AE = other advanced economies; ME = Middle East; SE Asia = Southeast Asia.

Global population, GDP, and clean energy investment, 2023



Source: International Energy Agency. World Energy Outlook 2024

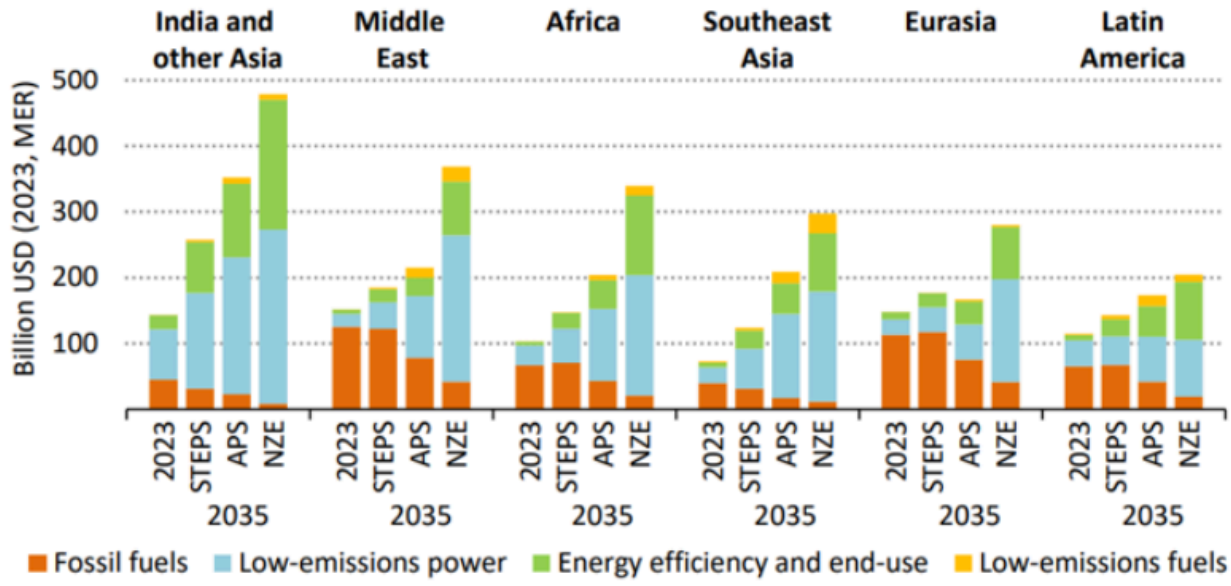
Notes: Other EMDE = emerging market and developing economies, excluding China.

The IEA models three scenarios for the year 2050:
Stated Policies Scenario (STEPS): Provides an indication of the prevailing direction of the energy system, based on a detailed assessment of current policy settings.
Announced Pledges Scenario (APS): Outlines a pathway for the energy sector if all national energy and climate commitments — including long-term net zero targets — are met in full and on time.
Net Zero Emissions by 2050 Scenario (NZE): Describes a trajectory in which the energy sector reaches global net zero CO_2 emissions by 2050, consistent with limiting the long-term average global temperature rise to 1.5°C, while also achieving universal energy access by 2030 and air quality goals.

Thus, from a demand perspective, greater efforts will be needed to replace fossil fuels as the main energy sources in developing economies. From a supply perspective, expanding the availability of resources and technologies to meet these demands will be crucial. High capital costs, scarcity of long-term financing, and macroeconomic fragility in many emerging markets continue to hinder progress in the energy transition. Added to this is the need to establish a clear vision that actively incorporates the private sector and creates an enabling investment environment. This context underscores the urgency of long-term economic planning, coupled with stronger regional coordination and cooperation.

Currently, nearly 80% of clean energy investment originates from domestic sources. In economies such as China, local financing covers up to 90% of projects. However, for the rest of developing economies—given the magnitude of resources required to expand generation capacity and enable participation in global value chains—it is essential to increase international capital participation, whether through Foreign Direct Investment or alternative instruments such as green bonds capable of mobilizing large-scale private financing. Likewise, development finance institutions can play a more decisive role by acting as catalysts for debt and equity resources.

Annual energy sector investment in emerging markets and developing economies, 2023 and 2035



Source: International Energy Agency. World Energy Outlook 2024

Although lower labor costs should, in principle, provide a comparative advantage to attract investment, the reality has been uneven. Africa and Latin America still show limited industrial development in technologies associated with the energy transition. This lag reflects investor perceptions of risk due to the limited scale of domestic markets, the absence of adjacent industrial capabilities, and the lack of supplier ecosystems—factors that are decisive when determining the location of manufacturing plants. Conflicts related to licensing and large-scale project development—often linked to bureaucratic obstacles—also discourage a favorable business environment.

The need to diversify supply chains for critical minerals opens a window of opportunity for developing countries to address internal challenges, shifting their historical role as raw material exporters toward greater leadership in value-added activities such as refining and manufacturing within this industry.

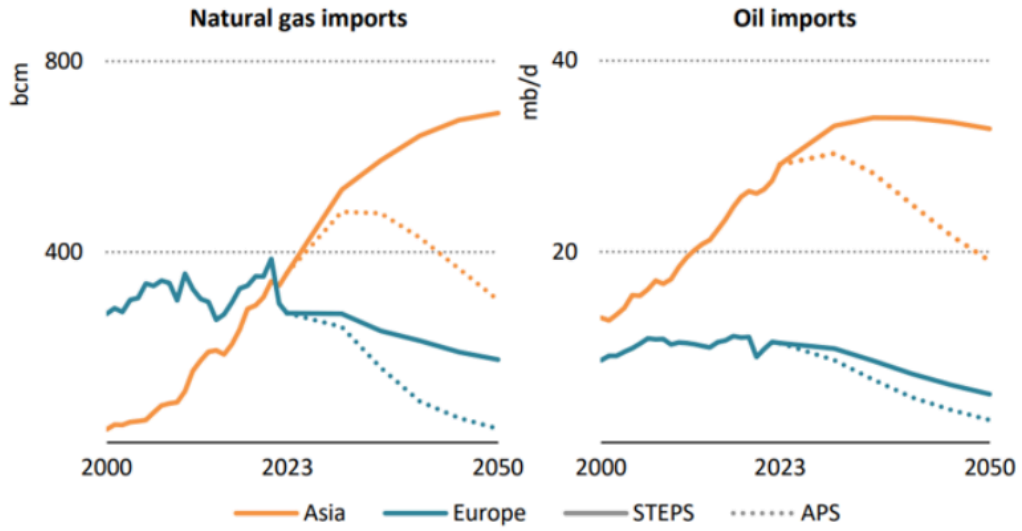
Under the STEPS scenario, over 6 million new energy-sector jobs are projected globally by 2030—a figure that rises to 15 million under the NZE scenario. Electric vehicles and batteries will absorb the largest share of this workforce. Therefore, promoting technical and professional training programs aligned with the new demands of the energy industry should be a public policy priority.

Securing a position in the new clean energy economy requires coordinated efforts between the public and private sectors, multilateral organizations, and regional integration frameworks to mobilize the investment volumes needed to scale the sector and ensure its long-term sustainability.

On another front, the expansion of clean energy is reshaping the global fossil fuel balance—with the sharpest impact on coal and a partial transition toward natural gas, especially in its liquefied form (LNG). The United States and Qatar will lead the expansion of export capacity, opening opportunities for new players, including Latin America. Under the STEPS scenario, LNG demand grows at an annual rate of more than 2.5% through 2035, though its evolution will depend on how quickly markets like Europe and China accelerate investment in renewables. Yet, supply surpluses may translate into lower prices, benefiting developing economies that import coal—offering a viable path to accelerate their own transitions.

In the oil market, producers in the Americas (the U.S., Brazil, Guyana, and Canada) are expected to gain prominence, creating tensions for OPEC+, although the Middle East will consolidate its role as the main exporter, with a growing orientation toward Asia. China will remain the world's largest oil importer through 2050, while imports by India and Southeast Asia are expected to rise by around 35% by then.

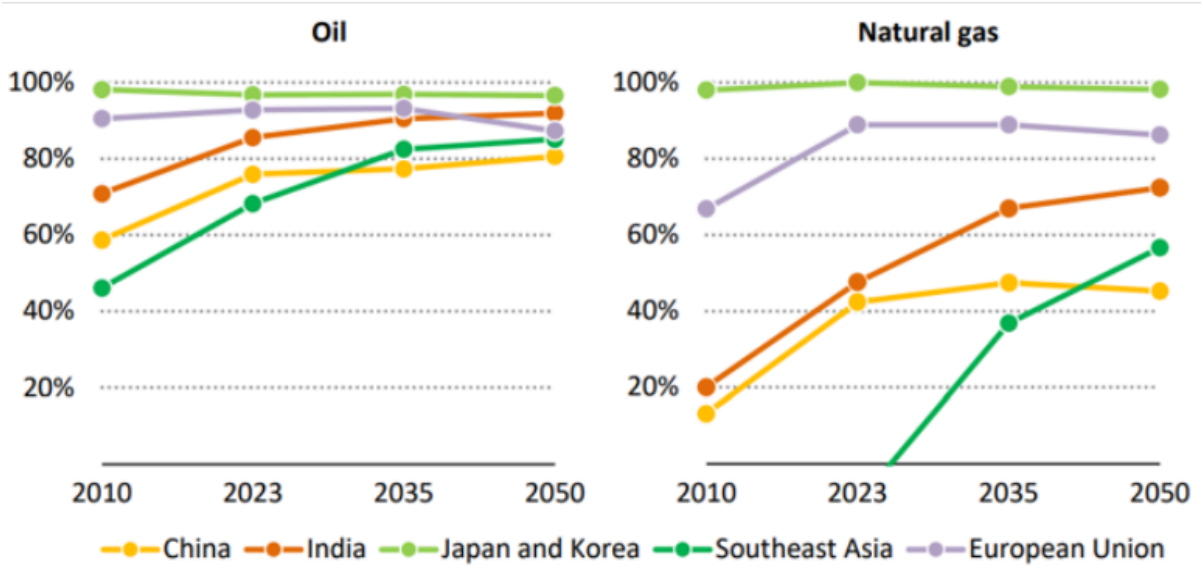
Natural gas and crude oil imports for Asia and Europe in STEPS and APS



Source: International Energy Agency. World Energy Outlook 2024

Notes: bcm = billion cubic meters; mb/d = million barrels per day. Asia includes Japan, Korea, and developing Asian countries.

Oil and natural gas import dependency by country and region in STEPS, 2010–2050



Source: International Energy Agency. World Energy Outlook 2024

This context confirms the interdependence of the energy system and its price sensitivity. Thus, reducing investment in fossil fuels must be accompanied by a substantial increase in clean energy investment to maintain energy security. Poor synchronization between supply and demand could generate supply risks and increase costs for consumers—particularly the most vulnerable.

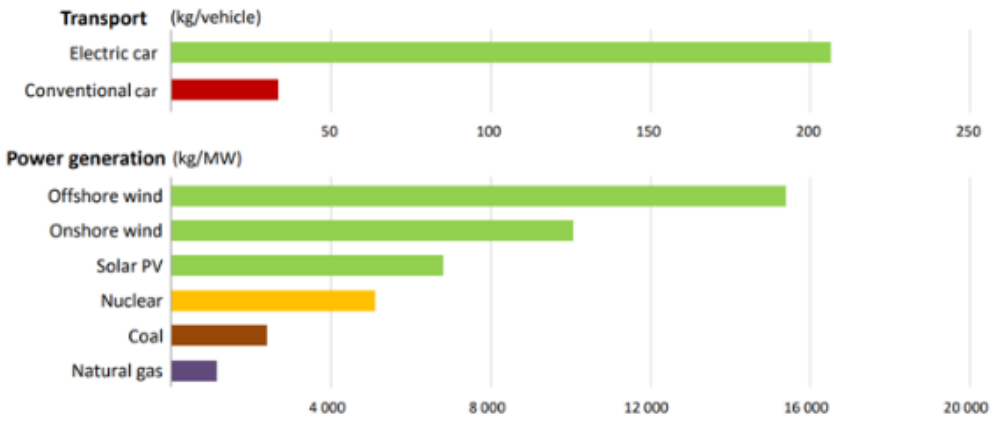
The success of the global transition will depend on public policies that lower investment barriers—especially in developing economies—and strategies that strengthen technology and critical mineral supply chains. Greater openness and competition will ultimately benefit end users, who will have access to more affordable and efficient technologies. This will also contribute to reducing energy inequality.

If the goal is to look toward a more sustainable future, we must go beyond climate targets. We must expand opportunities for emerging actors to take part in this transition and close development gaps. As the next chapter will show, addressing supply chain concentration and stimulating investment across more regions will lead to a safer and more inclusive transition for all.

2. Critical minerals and their concentration

The global energy transition relies on a solid foundation of strategic minerals, whose production will increase in the coming years to meet climate neutrality commitments and ensure energy security. Elements such as lithium, nickel, cobalt, copper, graphite, and rare earths are indispensable for manufacturing batteries, wind turbines, solar panels, and electric vehicles. To close the gap between the STEPS and NZE scenarios by 2035, clean energy must expand 1.5 times faster in China, 1.9 times faster in advanced economies, and three times faster in other developing economies[4]. This represents a difficult challenge to achieve, primarily due to the current configuration of this market.

Use of minerals in energy technologies



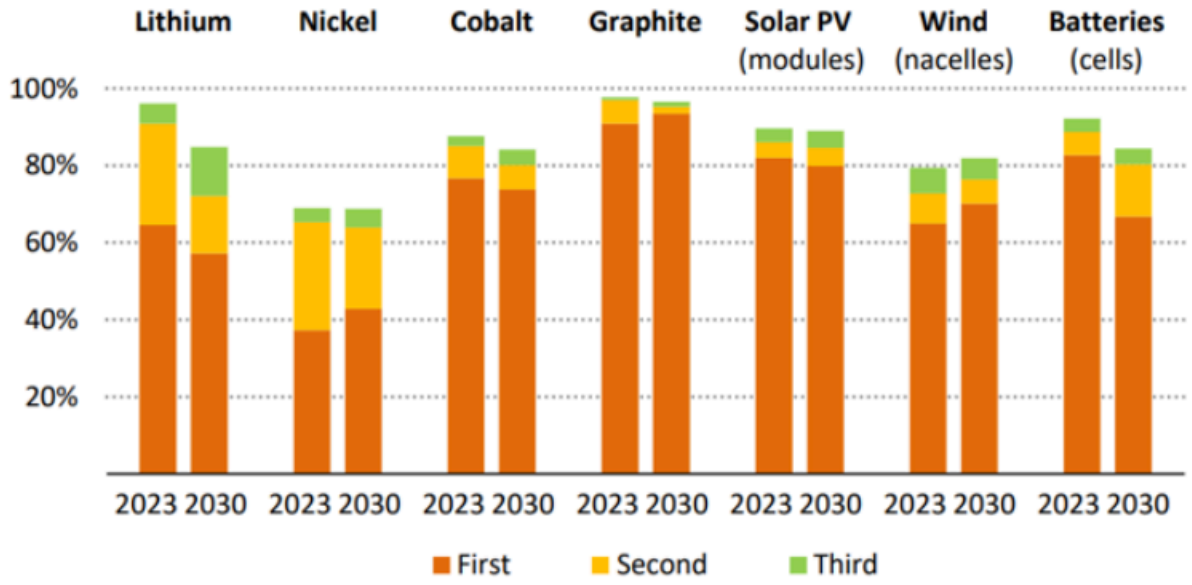
Source: International Energy Agency. The Role of Critical Minerals in Clean Energy Transitions

[4]International Energy Agency. World Energy Outlook 2024.

While demand for these minerals is growing at an accelerated pace, their extraction and processing are highly concentrated in a few countries — even more so than traditional hydrocarbons. The top three producers account for around 80% of global lithium, cobalt, and rare earth production, and about 60% of nickel. Contrary to what might be assumed, oil and gas are more evenly distributed. The three main oil producers account for only 40% of global output, and leading exporters span a wide geopolitical range, from North America to the Middle East and Russia[5].

The geographic concentration of refined products has also increased in recent years for nearly all critical minerals, particularly cobalt, lithium, graphite, and rare earths. Between 2020 and 2024, China's dominance expanded across almost all key minerals. Looking ahead to 2035, the average share of the top three suppliers of refined materials is projected to decrease only marginally, to 82%, returning to concentration levels observed in 2020[6]. Refining capacities can be even more difficult to develop than extraction, leading to challenges in reconfiguring trade corridors unless a diversification-oriented plan is implemented. Consequently, any geopolitical fragmentation puts at risk the supply required to meet national energy transition targets.

Share of the top three producers of critical minerals and clean technologies in APS

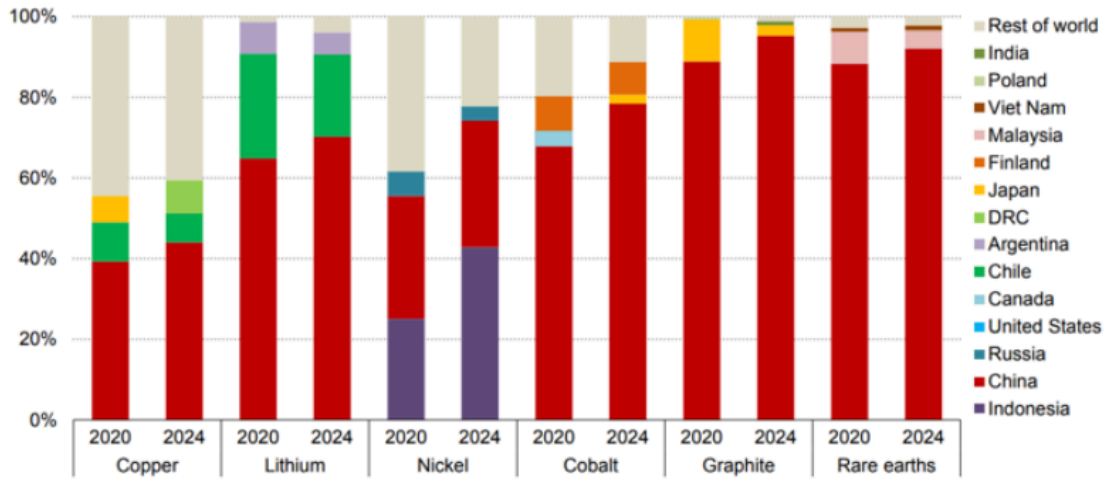


Source: International Energy Agency. World Energy Outlook 2024

Notes: Critical mineral data refer to refined material production.

[5]International Energy Agency. The Role of Critical Minerals in Clean Energy Transitions.
[6]International Energy Agency. Global Critical Minerals Outlook 2025.

Share of refined material production by country

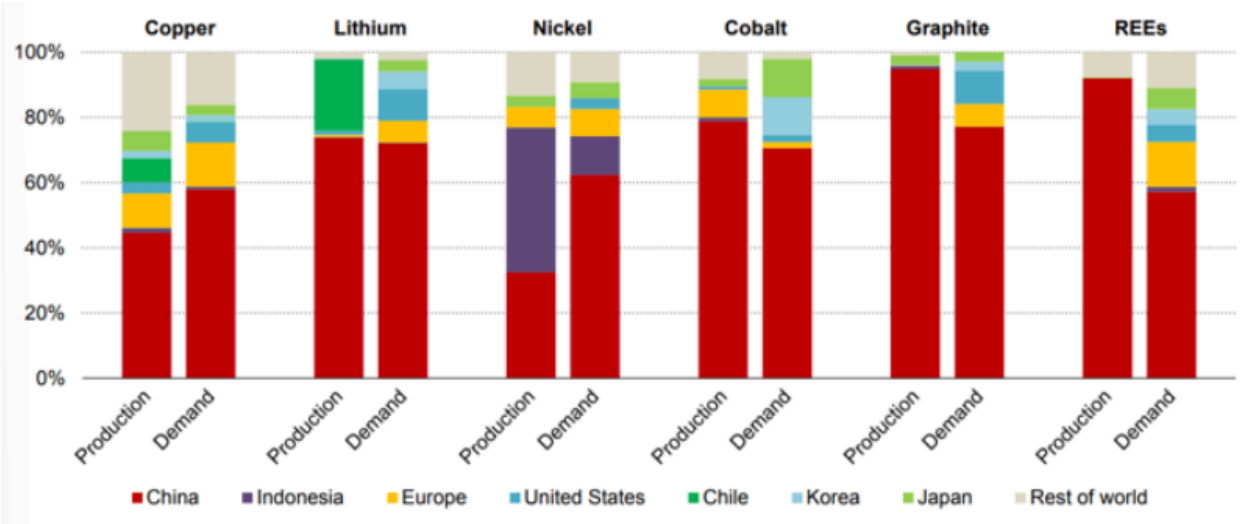


Source: International Energy Agency. Global Critical Minerals Outlook 2025

Notes: DRC = Democratic Republic of the Congo. Graphite refers to spherical and synthetic battery-grade graphite. Rare earths refer exclusively to magnetic rare earth elements.

China is, by far, the largest source of demand for critical minerals, accounting for more than half of global consumption. However, Europe, the United States, and Japan are also major consumers. This reflects the dynamics described in the previous chapter — a race for leadership in this transition — both to diversify energy matrices and reduce dependence on fossil fuels, as well as to steer technological development and the future economy.

Production and demand of refined critical minerals by geography, 2024

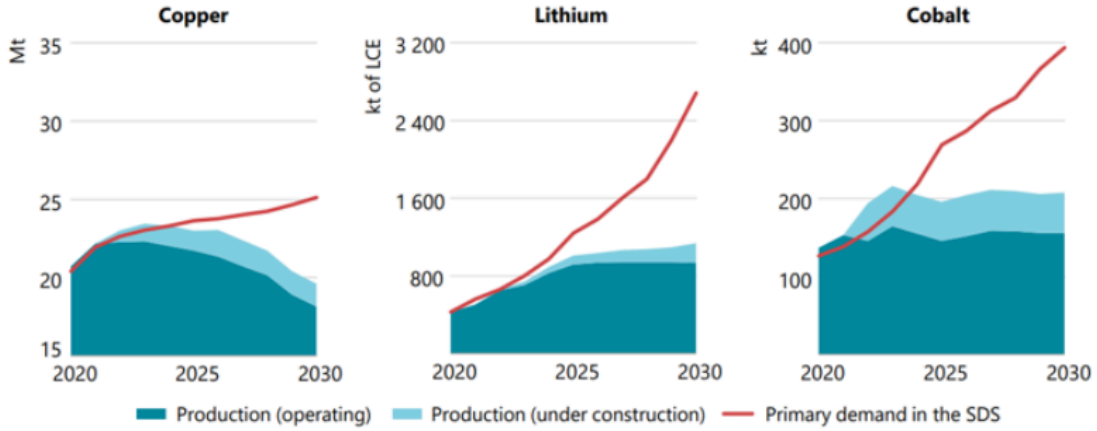


Source: International Energy Agency. Global Critical Minerals Outlook 2025

Notes: REE = rare earth elements. Production refers to refined mineral output, while demand refers to refined mineral consumption. Rare earths refer exclusively to magnetic rare earth elements.

Against this backdrop, appetite for these minerals will continue to surge. Under the STEPS scenario, lithium demand will increase fivefold by 2040, while demand for graphite and nickel will double. Cobalt and rare earth demand will also grow strongly, increasing between 50% and 60% by 2040. Copper, already the most established market, is projected to see a 30% increase in demand over the same period. Although most of these minerals are expected to be adequately supplied under this scenario, copper and lithium stand out as major exceptions, with implicit deficits of 30% and 40%, respectively, by 2035. Even under high-production assumptions, both minerals face notable supply shortages (IEA, 2025). However, meeting the Paris Agreement goals requires a faster energy transition than the one outlined in STEPS, which could cause demand to rapidly outpace supply. In other words, it would imply quadrupling mineral requirements by 2040, and achieving NZE by 2050 would require six times more mineral inputs by 2040 than today (IEA, 2022). Even under current market conditions, there remains a risk of shortages that could significantly shift the supply-demand balance projected in STEPS. For battery metals and rare earths, supplies outside the leading producer will, on average, cover only half of the remaining demand by 2035.

Committed mine production and primary demand (SDS)



Source: International Energy Agency. The Role of Critical Minerals in Clean Energy Transitions

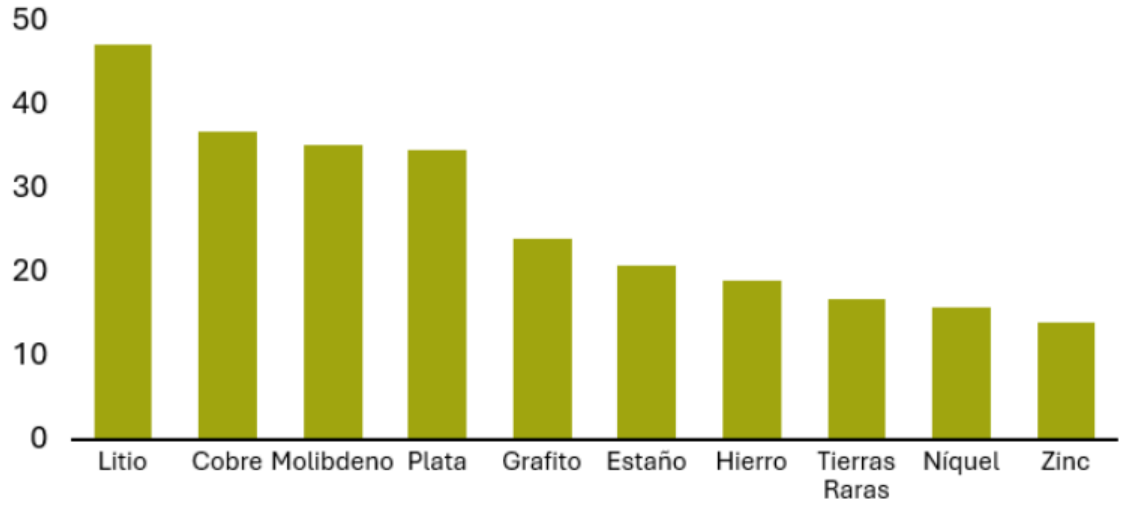
In recent years, the critical minerals market has shown volatile behavior. Lithium demand, for example, grew by nearly 30% in 2024 — well above the historical rates of the previous decade. Nickel, cobalt, and graphite also recorded sustained annual increases, driven mainly by the boom in electric vehicles, energy storage, and grid expansion. However, as supply expanded even faster — led by China, Indonesia, and the Democratic Republic of the Congo — strong downward pressure on prices emerged, reversing the extraordinary peaks of 2021–2022. Lithium, whose price had multiplied eightfold, lost more than 80% in the past two years. Cobalt, nickel, and graphite also experienced declines of between 10% and 20%

While falling prices may seem positive for consumers, they present a structural challenge: they discourage investment in new projects outside dominant countries. With higher capital costs in Latin America, Africa, and other emerging regions, low prices make it difficult for nascent projects to compete with established producers. This reality raises concerns, as any geopolitical, economic, or environmental disruption in these production centers could alter supply chains, raise costs, and hinder the development of clean technologies. Yet it also opens an opportunity to take action in response to the undeniable need to involve more actors in this process, particularly to meet rising demand under a more competitive ecosystem.

In this scenario, regions with abundant natural resources and geographic advantages, such as Latin America, emerge as potential actors to diversify supply and strengthen value chain resilience. However, harnessing this potential requires overcoming structural barriers, designing clear regulatory frameworks, and building industrial and technological capacities that add value beyond extraction. Latin America and the Caribbean hold a significant share of global reserves of critical minerals:

- Lithium: more than 50% of global reserves, mainly in the “lithium triangle” formed by Argentina, Bolivia, and Chile.
- Copper: 37% of global reserves, with Chile and Peru as undisputed leaders.
- Molybdenum: 35% of global reserves, with Mexico, Peru, and Chile among the main suppliers.
- Nickel: Brazil, Colombia, and Cuba possess significant resources.
- Rare earths: Brazil stands out as one of the countries with the greatest untapped potential.

Latin America’s share of global mineral reserves

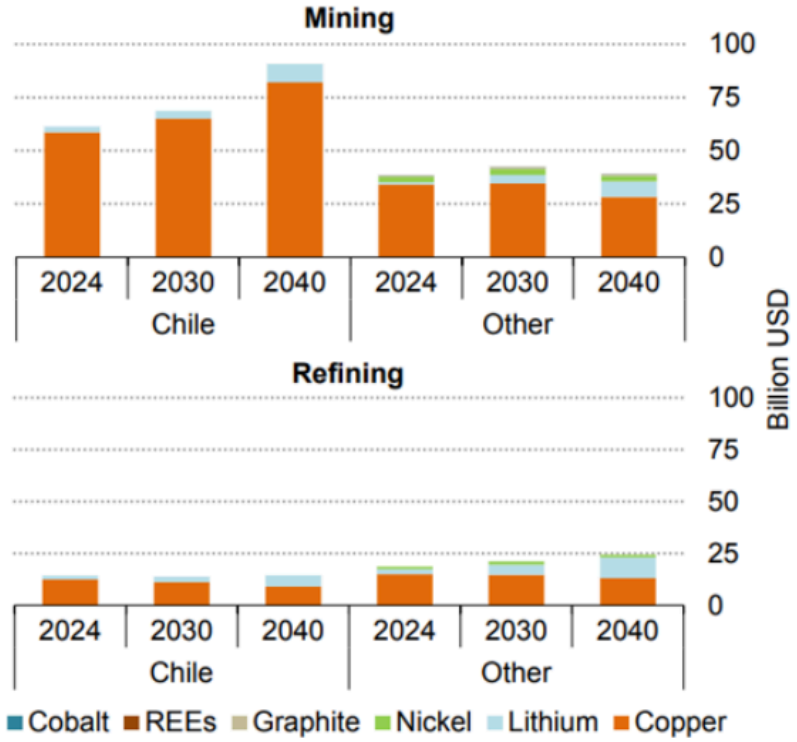


Source: J.P. Morgan, The Future of Regional Integration: Can Latin America Thrive in a New Era?

Additionally, the region offers key geographic and commercial advantages:

- Access to both the Atlantic and Pacific oceans, facilitating connections with Asia, North America, and Europe.
- Trade integration frameworks such as Mercosur, the Pacific Alliance, the Andean Community, and the Central American Integration System — initiatives that, despite challenges and limited unity, lay the groundwork for greater regional cooperation. Added to this are bilateral agreements with the United States and the European Union.
- A well-established mining tradition that provides regulatory experience, a skilled workforce, and local supplier networks.

Market value of critical minerals in Latin America, 2024



Source: International Energy Agency. Global Critical Minerals Outlook 2025

For advanced economies, the challenge is twofold. On one hand, they must mitigate risks stemming from excessive concentration by broadening and diversifying their supply chains. On the other, they face a growing cost gap in clean technology manufacturing — particularly batteries — which increases their vulnerability to prolonged disruptions and loss of competitiveness vis-à-vis China.

Concentration also translates into vulnerability to export restrictions and geopolitical tensions. Since 2023, several countries have adopted measures to protect their reserves or influence markets:

- China restricted exports of key minerals for the semiconductor industry, such as gallium and germanium, to the United States.
- The Democratic Republic of the Congo temporarily suspended cobalt exports to stem falling prices.
- Other nations have begun to regulate not only raw material exports but also the export of processing and refining technologies.

More than half of energy-related strategic minerals are currently subject to some form of trade control. This not only affects supply security but also increases price volatility and generates uncertainty for long-term investment decisions.

Amid these developments, many economies are intensifying efforts to accelerate mining projects essential for the energy transition and for expanding sectors such as electric vehicles. The United States, the European Union, Canada, Australia, and Middle Eastern countries have strengthened public policies, created investment funds, and streamlined permitting for mining projects, while simultaneously signing bilateral agreements with resource-producing nations.

At the same time, several resource-rich countries are shifting their strategies. Rather than simply exporting raw minerals, they are moving toward policies that retain more value by banning unprocessed mineral exports and promoting the development of refining and manufacturing capacities. Indonesia, the Democratic Republic of the Congo, and the Philippines are examples, and Latin America is beginning to follow this approach — with Bolivia seeking partnerships to develop its lithium value chain. Southeast Asian countries have also strengthened regional cooperation for development, while India's ambitious National Critical Minerals Mission highlights the need to secure mineral supply chains. All of this will require greater international coordination and collaboration between producing and consuming countries.

For instance, over the past two decades, China has consolidated its position as the main investor in critical mineral projects in emerging economies. Most of these investments have focused on copper and cobalt projects — essential for power grids and battery manufacturing — as well as nickel, with Indonesia as a key example. An innovative element of China's strategy lies in the evolution of its financing mechanisms. Initially, most resources came from state financial institutions created to meet national objectives. Currently, through the Belt and Road Initiative, China has diversified its approach, and investments now come primarily from state-owned commercial banks, allowing greater flexibility and market responsiveness.

The current model relies on limited-recourse financing structures (where debt is secured solely by the project's cash flows and assets), using special-purpose vehicles (SPVs) and joint ventures. In this way, financial risk is shared between local and international actors, while Chinese companies secure long-term access to essential mineral production. Through this scheme, extracted resources are not lost to the open market but instead are channeled steadily toward China. This financing model demonstrates that merely providing loans or purchasing minerals on the open market is not enough: the key lies in creating long-term alliances with producers through co-investment and offtake agreements. This model not only reduces exposure to price volatility but also facilitates infrastructure development in emerging countries. For advanced economies, it serves as a reminder that competing in this field requires adopting more integrated and strategic frameworks.

Thus, the United States, the EU, and other major powers seeking to diversify their suppliers will need to consider this when designing their policies. While Latin America, with its vast reserves, emerges as a natural partner in this diversification strategy, it will require clear regulatory frameworks and foreign direct investment policies focused not only on extraction but also on processing. The experience of countries such as Indonesia shows that bans on unprocessed mineral exports, combined with incentives, can catalyze investment in refining plants. Likewise, the rapid growth of the electric vehicle market creates additional opportunities for the region to host battery assembly or manufacturing plants. Brazil and Mexico's experience in these industries can serve as references for building regional ecosystems.

Both traditional powers and emerging blocs such as China and ASEAN have incentives to deepen their engagement with Latin America. For the former, it represents a way to reduce vulnerabilities and strengthen resilience in their clean industries; for the latter, it offers the opportunity to secure stable mineral flows to meet major climate challenges and expand manufacturing capabilities through value chain integration and new market access.

At the same time, capacity-building and knowledge transfer represent a high-potential area for cooperation, given the wide differences in expertise and institutional development among countries. Economies such as Australia, Canada, and the United States — with solid regulatory frameworks for managing environmental and social impacts — can expand their technical assistance to the region. For example, Australia's Critical Minerals Strategy 2023–2030 outlines a vision to position the country as a global leader in ESG performance in mining project development, while increasing investment and building a skilled workforce. Among its recent legislative advances is the Future Made in Australia Act, which establishes a major investment plan to incentivize critical mineral production and reduce dependence on foreign suppliers[7].

[7] https://esgnews.com/es/El-gobierno-australiano-revela-una-inversi%C3%B3n-de-15-mil-millones-para-impulsar-los-minerales-cr%C3%ADticos-para-las-energ%C3%ADas-renovables./#:~:text=Esta%20medida%20estrat%C3%A9gica%20es%20parte%20del%20esfuerzo,%22Nuestro%20plan%20maximizar%C3%A1%20los%20beneficios%20econ%C3%B3micos%20e

Therefore, for Latin America to fully capitalize on its advantages and gain prominence in this market, it must address structural challenges and design a forward-looking vision supported by strong institutional measures. For instance, the shortage of skilled labor in advanced stages beyond extraction — such as refining or clean technology manufacturing — can be mitigated through public leadership in promoting technical education programs in materials chemistry, battery engineering, or mining process automation. The region must also strengthen its industrial capacity, reduce its perceived investment risk (which impacts capital costs), establish consistent regulatory and social frameworks, and close its infrastructure gap, which constrains logistics competitiveness.

Overcoming these limitations and unlocking regional potential requires a long-term strategic vision based on regional cooperation — not only to diversify global supply chains but also to position Latin America as a central actor in the new clean energy economy. Diversification will not materialize solely through market forces; it will require robust support policies and well-designed partnerships.

3. Roadmap for Latin America

Latin America has notable potential in renewable generation sources and critical minerals that, if fully leveraged, could become an engine for economic growth, productive diversification, and strengthened regional energy security. This chapter proposes guidelines and scenarios to bolster the region's role in supplying clean energy and critical minerals so that it can integrate more actively into global value chains through 2050.

The integration experience of blocs such as ASEAN is illustrative because it shows that regional coordination, the construction of integrated clusters, and the development of technological ecosystems are critical elements to position a region as a strategic actor in global supply chains.

Southeast Asia contributes to the extraction of critical minerals with countries such as Indonesia and the Philippines, promoting policies that prioritize domestic processing and industrial transformation through export restrictions and the attraction of foreign investment. A key element has been regional cooperation, exemplified by the 2023 ASEAN Declaration seeking the formation of a Regional Electric Vehicle Ecosystem, coordinating the efforts of several countries to build shared and globally competitive supply chains. Initiatives of this kind demonstrate how, by integrating complementary capabilities and an active public sector role, ambitious projects can be developed.

Across Asia, governments are implementing policies to develop critical minerals supply chains. India, as previously noted, through the National Critical Minerals Mission, seeks to increase exploration, recycling, storage and technological innovation. Japan and Korea, meanwhile, focus on more advanced stages of the chain: refining, recycling and strategic overseas investment, accompanied by national energy plans and fiscal policies to ensure stable supply. All of this complements plans to expand renewable sources in their energy mixes to serve booming sectors that will demand primarily electricity, while not neglecting the opportunities for innovation and economic diversification that arise.

Latin America, although it has taken important steps in countries such as Chile, Brazil and Argentina, still needs to consolidate a regional approach to scale its potential, avoid fragmentation, and meet its climate commitments. Given the steady rise in critical mineral demand over the next two decades, the region is exceptionally well positioned to benefit from this thanks to its vast resource endowment. Designing the right incentives would capture investor interest and could help consolidate a broader industrialization policy
.
Chile is a major copper producer, responsible for 24% of global output. In addition, the Salar de Atacama project has been an important source of lithium for years. Brazil[8], with its “Lithium Valley” in Minas Gerais and the Carajás mine, went from exporting nothing to being the fifth largest lithium exporter in 2023 and is projected to become a hub for copper, nickel, graphite and rare earths in the coming years. Chinese investments in the country have also been strategic for extraction, processing and the manufacture of electric vehicles, the latter driven by BYD[9]. Meanwhile, Argentina, Bolivia and Chile make up the “lithium triangle,” with expanding projects that attract international capital.

These examples demonstrate the region’s capacity. Yet its potential remains constrained, particularly by the passive posture of countries with unexploited resources or the foundations to develop complementary capabilities in more advanced stages. Thus, expected sector growth over the coming years is mainly due to copper extraction in Chile and Peru. Regarding refined materials, considering announced projects, the region is expected to represent around 7% of the global market value by 2040, with growth driven primarily by copper and lithium refining in Chile, Argentina and Brazil (IEA, 2025).

Fragmentation is one of the greatest risks in the absence of a shared strategy. For example, Argentina offers a liberal legal framework and fiscal stability through the RIGI[10], although doubts persist about its ability to sustainably attract capital due to economic and political fragility.

[8]https://gbv.wilsoncenter.org/article/brazils-critical-minerals-and-global-clean-energy-revolution
[9]https://money.usnews.com/investing/news/articles/2025-02-13/exclusive-chinas-byd-holds-mining-rights-in-brazils-lithium-valley-documents-show
[10]Régimen de Incentivos a Grandes Inversiones.

Bolivia has advanced bilateral agreements with Russia and China to develop lithium, but faces social resistance and lack of internal consensus, threatening project continuity. Brazil opts for a more institutional approach, mobilizing BNDES[11] esources to promote value chains in strategic minerals and to approve large-scale projects. Chile, through the 2022 National Mining Policy 2050 and the 2023 National Lithium Strategy, seeks to modernize its regulatory framework and accelerate permitting to attract more investment to the mining sector while maintaining environmental standards.

Therefore, greater articulation and harmonization of government policies and industrial strategies are necessary, consolidating a joint long-term vision to gain competitiveness. Latin America can aspire to become a model in the fight against climate change and lead its economies toward a net-zero path, thanks to the advantage of historically clean energy matrices—explained by the weight of hydropower and the widespread use of biofuels in transport—and with the possibility of incorporating other renewable sources such as onshore wind and solar. It could also position itself as a promising source of offshore wind energy and green hydrogen.

Critical minerals not only underpin the energy transition but have become strategic inputs for high value-added industries such as artificial intelligence, robotics, advanced electronics, defense and aerospace. Rising demand implies that economies capable of producing, refining and transforming these materials will play a central role in the new technological geopolitics. In a scenario where multiple sectors will compete for critical minerals and the need to expand supply sources intensifies, the region offers unique opportunities.

The development and exploitation of the region's mineral wealth must be a priority for governments. To achieve this, targets should be set across short, medium and long terms. In the short term, increase geological mapping investment to determine reserve potential and production capacity—essential for decision-making. This would also help plan public investments in infrastructure and R&D geared toward the mining industry. Second, develop special and simplified fiscal regimes that offset high capital costs to stimulate investor appetite. Third, review licensing processes and remove bureaucratic bottlenecks without compromising environmental and social requirements.

Medium-term objectives can focus on designing and implementing national critical minerals policies for the energy transition that promote sustainable mining standards and practices. Such a framework would guide companies in long-term investment decisions while being broad enough to involve, besides the sector, financial institutions, investment funds, communities and local governments.

[11]Banco Nacional de Desarrollo Económico y Social

Public policies also play a key role in a just energy transition from the demand side, facilitating early adoption of these technologies to establish robust and balanced internal markets. In many cases, without government support, low-income communities and households are likely to be left out of this change. Therefore, governments will have the authority to set the pace to be followed.

Another equally important objective is integration, building on existing agreements. No country can succeed alone; isolated governmental initiatives produce uneven results. Regional integration would help identify the largest export opportunities for raw materials, possibilities for local processing and the creation of clean-energy value chains. It would also provide a comprehensive policy framework to attract investment or carry out co-investments, offtake agreements and shared risk-reduction mechanisms. Without a common effort framed in a detailed roadmap, regional mining potential will remain untapped, squandering an opportunity for economic and social development.

Development of new mining projects cannot be limited to the public sector. It is necessary to complement them with market mechanisms based on rules that reduce volatility, provide price stability and build confidence to attract private investment. Tools such as contracts for difference, floor-and-cap schemes or volume guarantees offer greater certainty about long-term demand and profitability, facilitating the entry of new actors into the sector.

In addition, market access policies based on sustainability standards can ensure that only responsibly extracted minerals access certain strategic markets or public contracts. This not only improves producers' international reputations but also opens the possibility of obtaining preferential conditions.

For Latin America to leverage its high potential to establish supply chains for critical minerals and derived energy technologies, we base the following recommendations on the analysis presented so far—without any specific ordering—which can serve as a starting point to broaden the debate and build common regional cooperation frameworks:

- Design stable and scalable regulatory frameworks that provide political and economic predictability for investors and enable projects to be integrated into global value chains. Likewise, promote contractual standardization and a regional green taxonomy to channel international capital.

- Implement sustainability and governance certifications that distinguish Latin American producers in the global market.

- Establish minimum local processing requirements before export, replicating experiences such as Indonesia's in nickel, but accompanied by investment incentives for clean technologies.

- Consolidate the region's role as a strategic copper supplier by leveraging its geological and production advantages, while promoting investment in refining and semi-finished copper manufacturing to capture greater added value. In addition to the current players, Panama has one of the largest potential projects, and its supply is expected to increase by 2035. It will be necessary to boost exploration in countries with potential reserves to expand supply sources.

The global outlook shows that emerging Asian economies such as India and Vietnam are becoming major consumers of refined copper. Their rapid industrialization and urban and demographic growth explain why, by 2050, they will jointly account for more than 15% of global demand. *These trends open market opportunities both to attract investment into the refining industry and to design long-term supply contracts and productive integration partnerships.*

- The expansion of artificial intelligence and data centers is creating an additional source of copper consumption, with projections showing a global demand increase of between 1% and 2% by 2030. Developing an incentive framework to attract these investments should focus on establishing such ecosystems, as well as promoting investments to expand renewable energy generation capacity to meet the new energy demands that will arise.

- Lithium: Increase exploration, invest in refining infrastructure, establish long-term contracts with new consumers, and consolidate production clusters for EVs and batteries. The lithium market is in an expansion phase, with demand growing 30% annually—driven mainly by electric vehicles and, increasingly, by energy storage. Although China still accounts for over three-quarters of demand, new consumption hubs are emerging in Japan, Korea, and, from 2030 onwards, in the United States, the European Union, India, and Indonesia. While China extracts only 22% of lithium resources, it refines 70% globally.

- Nickel is undergoing a transformation in its global demand pattern. In 2024, energy technologies represented nearly 20% of total demand, projected to rise to just over 40% by 2040 under the STEPS Scenario. Brazil already stands out as a key player in developing new refining capacities; a coordinated regional strategy would allow Latin America to leverage Brazil's leadership in refining and that of other Andean countries with geological potential or as possible suppliers of inputs or logistics infrastructure.

- Plan Special Economic Zones for clean energy that become production hubs offering tax and regulatory incentives focused on the manufacturing of batteries, solar panels, and electric vehicles.

- Design a master plan for regional electrical interconnections to establish harmonized rules for trading low-cost clean energy within the region. For instance, implement energy corridors to optimize renewable energy surpluses or create a green hydrogen platform to coordinate large-scale production for both domestic markets and exports to Europe and Asia.

- Development of training and technology transfer programs: Invest in technical education and training programs to meet labor demand in advanced mining and related industries.

- Shared R&D centers: Create regional hubs with universities and business consortia to develop innovation in energy storage, battery recycling, and electric mobility.

- Create a regional agency for energy and critical minerals to coordinate geological data, ESG standards, and joint procurement.

- Establish a regional guarantee and blended finance fund (CAF, IDB, local banks, and sovereign funds), inspired by the Minerals Security Partnership[12], to mobilize and incentivize private-sector investment in exploration, refining, and downstream industrial projects—reducing risk and enhancing the viability of priority initiatives.

- Forge long-term partnerships with buyers through co-investment, joint ventures, and offtake agreements. This model not only reduces exposure to price volatility but also facilitates infrastructure development in emerging economies.

- Adopt price stabilization mechanisms. These must follow a rigorous design since poorly structured mechanisms can produce opposite effects: government dependency, uncompetitive markets, or rigid supply relationships that fail to adapt to global shifts. Therefore, long-term agreements should be periodically reviewed, and flexible price reference frameworks should be built to ensure efficiency and responsiveness to global demand.

- Capitalize on the international context to develop agreements with multiple powers. The United States and the EU —seeking supply security and reliable partners—could expand their presence in the region through specialized investment funds. China, which remains the largest consumer of minerals and a key player in battery manufacturing, offers opportunities to attract co-investment in refining and recycling. ASEAN and the Middle East, with their interest in diversifying mining investments to secure supply, represent potential opportunities for co-investment and technology transfer projects.

[12] https://www.state.gov/minerals-security-partnership

- It will be crucial for importers of critical minerals with ambitious climate goals to work closely with producing countries to minimize the social and environmental impacts associated with the expansion of extractive activities.

Recommendations for Colombia:

1. Develop a national policy for the extraction and processing of critical minerals:

- Nickel: The potential for refined nickel production in Colombia is significant, thanks to its geological location within the Pacific Lateritic Nickel Belt and the presence of deposits such as Cerro Matoso.

- Copper: Increase exploration in regions such as Antioquia, Santander and Putumayo; other high-potential regions include Córdoba, Cesar and Chocó. Make copper a driver of investment attraction by learning from Chile and Peru, while prioritizing local processing from the outset.

- Lower-footprint gold: The country has gold deposits across multiple municipalities, with Antioquia and Chocó leading production. Colombia's gold sector comprises artisanal, small-scale and large-scale mining, which allows for different levels of investment and exploitation.

- Rare earths: Colombia has potential for production of these minerals in departments such as Vichada, Guainía, Vaupés and Guaviare. Attract investment from countries interested in diversifying supply, such as the EU, Japan and Korea.

- Although Colombia is not a major lithium producer, it could create a research and pilot processing center in partnership with Bolivia, Chile and Argentina.

2. Increase investment in clean-energy generation projects where high potential exists and whose surpluses could be supplied to a regional common market:

- Solar photovoltaic.
- Onshore and offshore wind.
- Hydroelectric.
- Green hydrogen.
- Geothermal.

3. Leverage geopolitical advantages to form strategic commercial alliances.

- **European Union:**

1. Use the Colombia-EU Trade Agreement and the Global Gateway[13] to finance low-carbon copper projects and co-finance green infrastructure projects, refineries and ports.
2. Seek long-term contracts for refined nickel and rare earths in partnership with European battery manufacturers.
3. Develop resilient supply chains in: electric mobility, renewable energies, storage and AI.
4. Create Special Economic Zones for cleantech-related manufacturing.

- **United States:**

1. Standardize ESG criteria so that Colombian minerals can enter North American supply chains for electric vehicles, batteries, and wind turbines.
2. Encourage joint ventures with U.S. companies in nickel and copper refining.
3. Use the Alliance for Economic Prosperity in the Americas (APEP) as a financing platform and to develop priority workstreams that deepen regional economic cooperation.
4. Join the Western Hemisphere Semiconductor Initiative supported by the International Fund for Security and Technological Innovation[14] and the IDB to strengthen capabilities in semiconductor assembly, testing, and packaging, and to expand the skilled workforce through memoranda of understanding with multiple U.S. universities under the initiative.

- **China:**

1. Promote FDI from Chinese firms into exploration and extraction projects for critical minerals in exchange for investment in refining infrastructure within Colombia.
2. Link mining-energy projects with the development of logistics infrastructure through co-financing mechanisms.
3. Encourage the establishment of local production chains and the development of technical capacities associated with clean technology development.

- **ASEAN:**

1. Negotiate bilateral agreements with Indonesia and the Philippines—both advancing local processing of nickel and other minerals—to share regulatory experience and attract companies seeking to diversify their presence beyond Southeast Asia.

[13] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/stronger-europe-world/global-gateway_es
[14] https://www.state.gov/the-u-s-department-of-state-international-technology-security-and-innovation-fund

2. Offer fiscal stability and long-term offtake agreements to firms from Malaysia, Thailand, and Vietnam that want to establish joint ventures in refining in Colombia.
3. Engage sovereign wealth funds from the bloc as strategic investors in green mining and downstream projects.
4. Promote Special Economic Zones to integrate value chains in energy and technology manufacturing.

In summary, the transition to a clean-energy economy in emerging markets will not depend solely on the abundance of natural resources or on lower labor costs. The real challenge is to design a comprehensive strategy that combines: long-term energy planning; attraction of international capital through innovative financing mechanisms and public–private partnerships; development of industrial and regional clusters that integrate critical-mineral extraction, renewable energy, and associated manufacturing; investment in human capital; and strengthening regional cooperation to scale markets and increase competitiveness vis-à-vis already consolidated hubs.

Conclusions

Critical minerals are not merely extractive resources—they are geopolitical and strategic assets that will determine the success of the global energy transition. Any scenario aimed at achieving a low-carbon economy implies a substantial increase in overall mineral demand. While recycling and reuse will play an important role in meeting this demand, primary production will remain central to the manufacturing of clean technologies.

Latin America, endowed with vast natural resources and a strategic geographic position, has the opportunity to move from being a raw-material supplier to becoming a key player in the clean-technology value chains. To achieve this, coherent policies, regional cooperation, and international partnerships are required to reduce current concentration levels and strengthen the resilience of the global energy system toward 2050. The role of the public sector will be decisive in three key areas: attracting Foreign Direct Investment (FDI), reducing structural barriers, and fostering regional coordination.

Building a sustainable world transcends climate goals—it requires overcoming social and economic inequality through productive development, technological innovation, and global integration and cooperation. Correcting market imbalances that generate inefficiencies and limit progress to only a few is essential. The future cannot be envisioned without addressing the challenges of the present.

This document was produced by the Innovation for Development Foundation in collaboration with Saira Samur Pertuz, economist, and holder of master's degrees in Economics and Administration with a focus on Public Finance. Her technical and academic contribution has been essential to the preparation of the analyses presented herein.

References

IEA, I. E. (2025). Global Critical Minerals Outlook.

IEA, I. E. (2022). The Role of Critical Minerals in Clean Energy Transitions.

IEA, I. E. (2024). World Energy Outlook.

Morgan, J. (2025). La nueva ola arancelaria en América Latina: ¿Podrían las iniciativas estratégicas de comercio resguardar a la región?

Morgan, J. (2025). El futuro de la integración regional: ¿Puede América Latina prosperar en una nueva era?

McKinsey, G. I. (2025). The great trade rearrangement.

McKinsey, G. I. (2025). A new trade paradigm: How shifts in trade corridors could affect business.

IEA, I. E. (2025). Data and Statistics. Obtenido de Critical Minerals Data Explorer: https://www.iea.org/data-and-statistics/data-tools/critical-minerals-data-explorer

IEA, I. E. (2025). Data and Statistics. Obtenido de Critical Minerals Policy Tracker: https://www.iea.org/data-and-statistics/data-tools/critical-minerals-policy-tracker

Snyder, J. (2022). Europe snaps up FSRUs to speed energy security. Riviera News.

Hund, K. L., Arrobas, D. L., Fabregas Masllovet, T. P., Laing, T. J., & Drexhage, J. R. (2023). Minerals for Climate Action : The Mineral Intensity of the Clean Energy Transition. Washington, D.C. : World Bank Group.

UNCTAD, U. N. (2017). Using trade policy to drive value addition: Lessons from Indonesia's ban on nickel exports. Special Unit on Commodities.

EU, E. U. (2024). The future of European competitiveness. Publications Office of the European Union.

Vásquez, P. (2024). Wilson Center. Obtenido de Brazil's Critical Minerals and the Global Clean Energy Revolution: https://gbv.wilsoncenter.org/article/brazils-critical-minerals-and-global-clean-energy-revolution

INNOVACIÓN PARA EL DESARROLLO

Iván Duque Center for Prosperity and Freedom

@fimasd_org

www.fimasd.org