



Task Force 02

**SUSTAINABLE CLIMATE ACTION AND INCLUSIVE JUST ENERGY TRANSITIONS**

## Creating Value for the Critical Minerals Supply Chain in Latin America

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## Abstract

The growing demand for critical minerals in the energy transition poses a generational opportunity and a significant risk to resource-rich countries, especially in Latin America. According to the International Energy Agency, the region possesses about 35% of global reserves of copper and 50% of global reserves for lithium. While extraction is widely extended in the region, refining and processing are normally outsourced abroad, particularly for stages of processing that add the most value.

There is an immediate need to assess how resource-rich countries and local communities can reap the benefits associated with critical minerals production, refining, and processing. To scale critical mineral supply chains, local communities must be treated as partners in the process. This is vital for a just transition and meeting climate goals, as demand for metals such as copper—which is essential for electrification—is forecast to double by 2035.

This policy brief explores opportunities to promote ‘value-added’ economic activity within critical mineral supply chains in Latin America centered around three pillars: (i) forging a framework for global RD&D cooperation to develop local skills and technologies, particularly in refining and processing; (ii) leveraging the potential of regional cooperation to promote supply chain diversification; and (iii) providing a tax credit to localize and incentivize midstream and downstream critical minerals supply chains. This approach would position Latin America at the center of the energy transition, unlocking its economic potential to benefit from critical minerals supply chains, fostering sustainable growth, and aligning with global efforts towards a just energy transition.

## Diagnosis

Securing a “just energy transition for all” remained a constant as the G20 Presidency was passed on from India to Brazil in December 2023. President Lula stressed the need to have social inclusion, global governance reform, and the energy transition at the center of G20 discussions. President Modi’s Delhi Declaration [1], emphasized the importance of “just energy transitions to improve jobs, livelihoods, and strengthen economic resilience” while pursuing new development models that leave no one behind. Through the “Voluntary High-Level Principles for Collaboration on Critical Minerals for Energy Transitions”, G20 members agreed to ensure “reliable, diversified, sustainable and responsible supply chains for energy transitions, including for critical minerals.”

Energy security has emerged again on the global agenda as a growing concern due to recent geopolitical tensions and supply disruptions. Critical minerals are increasingly compounding this challenge as an essential component of renewable energy technologies for the transition, especially in a period where economies are attempting to reduce their dependence on fossil fuels. During the Energy Transitions Working Group meetings [2], under the G20 India Presidency, one of the six priorities agreed on was energy security and diversified supply chains. Members “emphasized the need to align global energy demand, ensuring the uninterrupted flow of energy [...] and maintain reliable, responsible supply chains, notably for critical minerals.”

The growing demand for critical minerals in the energy transition context poses a unique opportunity and challenge to resource-rich countries, especially in Latin America. Between 2017 to 2022, global demand from the energy sector was the main reason behind the demand increase of 300% for lithium, 70% for cobalt, and 40% for nickel. In this period, the share of total demand for lithium from clean energy applications rose from 30% to 56%, for cobalt from 6% to 17%, and for nickel from 6% to 16% [3].

Latin American countries hold a significant share of critical minerals reserves. The most notable minerals in the region are copper, lithium, and nickel, of which the region concentrates 38%, 61%, and 17% of the world's proven reserves respectively. Furthermore, the region's shares of the world's total production for these minerals are 45%, 29%, and 10% [4]. The production and commercialization of critical minerals have enormous effects on the regional economy, impacting employment, foreign investment, as well as access to foreign currency, monetary exchange rates, and fiscal revenues. Argentina, Brazil, Chile, Mexico, and Peru's economies are greatly affected by the fluctuations in these markets, benefiting from price increases and suffering during demand disruptions, due to their reliance on the export of non-beneficiated raw materials.

The critical minerals value chain goes beyond just mining or the “upstream,” also including refining and processing, known as the “midstream,” and ultimately manufacturing of the components required for energy technologies, or “downstream,” which encompasses cables, microchips, solar panels, lithium-ion batteries, electric vehicles, etc. Despite playing a key role in production, Latin American countries do not have relevant participation in refining, processing, or manufacturing using their resources, overlooking a great opportunity to foster high-wage formal employment, innovation, and development. According to the International Energy Agency, most of the refining capacity for copper and lithium is in China, which concentrates about 40% and 60% of the refined copper and chemical lithium respectively. Brazil possesses a smaller yet relevant share of nickel production, concentrating ~17% of global reserves and 4% of global production, which demonstrates the opportunity the industry may offer to upscale mid and downstream [4].

The lack of processing infrastructure and investments beyond extraction have raised many questions regarding the actual contribution of these industries to local communities'

and overall economic development. Many advocates consider knowledge transfer and capacity building limited due to the lack of incentives for localizing the value chain. Furthermore, activists have coupled social and environmental impacts to justify blocking additional mining projects, which might hurt economies and the global energy transition in the long term.

For the region to adequately develop a robust vertically integrated critical mineral industry, three things are necessary: technology transfers, government subsidies, and regional cooperation. When implemented in tandem these recommendations will address gaps in commercializing existing natural resources equitably benefiting the region. Transfer of technologies from developed economies is required to build local capacities while government subsidies will be critical in technology offtake and scaling. Additionally, regional cooperation will provide Latin America with economies of scale and a stronger voice on the global stage.

Most technology transfer efforts have been developed between high-income economies such as Australia, Canada, Japan, the United Kingdom, and the United States. Bilateral agreements, such as the Australia-United States Climate, Critical Minerals, and Clean Energy Transformation Compact [5], have identified collaboration on innovation as a focus area, and research, development, and demonstration (RD&D) collaboration was featured explicitly in an agreement between Australia and Canada [6].

## Recommendations

### **1. Forge a framework for North-South RD&D cooperation, workforce development, and technology transfer to develop local skills and technologies**

Considering the growing criticism from environmental groups and the extent to which critical minerals have surged in importance to policymakers globally, there is an urgency to foster global cooperation. Latin America should invest in more value-added economic activities, such as refining and mid-stage processing, as opposed to extraction and export of raw materials, which hold limited economic value.

However, the architecture for international collaboration in research, development, and deployment (RD&D) for critical minerals processing technologies, as well as workforce development, needs to be sufficiently scaled to enable the gestation of domestic processing industries in nations that are primarily exporters of raw materials. Together, the concepts of RD&D and workforce development can be referred to as capacity building, as they provide the technical baseline for the establishment of a value-added industry in the critical minerals value chain.

To date, international collaboration in capacity building for processing and refining has been sporadic. For emerging economies to contribute to the diversification of midstream globally, cooperation in capacity building will need to expand. To enable the development of a wider refining and processing industry in Latin America, a framework for RD&D collaboration, workforce development, and technology transfer should be established for information sharing and technical assistance between markets with mature midstream sectors. In partnership with the private sector, this framework could complement and enable investments in refining and processing infrastructure in Latin

America, to bolster technology transfer and access to intellectual property, which is essential to the development of this industry.

The movement towards value-added economic activity is critical to Latin American countries, as economic growth is disproportionately affected by volatility in commodity prices. For instance, raw materials' share of export product value was 55.7% as of 2021 in Brazil, a country with substantial nickel and lithium reserves [7]. However, establishing a technical baseline of skills and access to intellectual property for the most competitive critical minerals refining and processing technology will be difficult in the compressed period demanded by the rapid expansion of critical minerals demand.

Many global frameworks that support the expansion of critical minerals supply chains, such as the Minerals Security Partnership [8], have focused on facilitating investment or adherence to environmental and social governance standards. Nonetheless, the availability of capital alone will be insufficient to drive growth in new markets. Investments must be paired with technical assistance to develop capacity at the required rate. Building capacity for independent technical management in Latin America is in the interest of G20 members, due to its ability to foster competitiveness in global critical mineral midstream supply chains through diversification and prevent non-market practices, which can negatively affect price due to monopolies in refining and processing.

As such, the framework for RD&D collaboration, workforce development, and technology transfer should provide resources for universities and technical training programs in Latin America to share information and improve access to the latest technology employed by the private sector globally. This is essential to develop a workforce across the region capable of managing midstream industries that are cost-competitive on a global scale and enable the proliferation of high-skill jobs.

## **2. Provide a tax credit to localize and incentivize midstream and downstream critical minerals supply chains**

With approximately 60% of identified lithium reserves in the region, the region has a massive untapped potential, especially in prioritizing mid and downstream processes [3][9].

Countries like the United States, Canada, and Australia have heavily incentivized the development of domestic processing and refining capabilities. This is done through various tax credits and upfront subsidies that focus on developing and scaling innovative technologies. In the case of industries with high upfront capital expenditure, fiscal support from the government can mobilize private investment for project offtake. Public funding becomes critical in building and scaling new and expensive industries.

Studying successful fiscal support in other countries is important for Latin America to build a local critical mineral refining and processing supply chain.

Through the Inflation Reduction Act (IRA), the US offers tax credits worth 10% of upfront costs for setting up critical mineral refining and processing facilities [10]. Similarly, Canada provides tax credits and strategic funding initiatives for mineral processing, refining as well as refining facilities. Companies can avail tax credits of up to 30% of equipment purchase costs for machinery used in manufacturing [11].

Additionally, Canada has launched a unique model of “flow-through shares,” which allows mining companies to issue new shares for financing activities [12]. These shares can then be passed on to the investor who can claim 100% tax deductions on the amount invested. This severely reduces the tax burden experienced by investors in capital-intensive industries such as mining. India has introduced “production-linked incentives” to promote local battery manufacturing, despite not being considered reserve-rich in



critical minerals. The sole focus in these examples is to incentivize the production of the midstream and downstream products.

As companies look to integrate supply chains vertically, the region is primed to localize critical mineral mining, refining, processing as well as recycling. Given budgetary constraints, incentives in the form of tax credits for processing, refining, and recycling facilities will encourage foreign investment and development of localized supply chains.

A tax credit of up to 20% on the purchase of equipment and machinery required for mineral processing is recommended. The total budget for this can be capped at USD \$1 billion. This would reduce the burden of upfront capital expenditures traditionally borne by the mining company.

Furthermore, since most of this machinery and equipment will need to be imported from countries with more advanced manufacturing, a reduced import duty on these goods (i.e. grinders, crushers, conveyors, and feeders) is also recommended. With reduced import duties and tax credits incentivizing vertical integration of critical mineral mining, production costs in Latin America will become more competitive.

Additionally, incentives for export promotion will enable participation of foreign companies that have the technical knowledge and innovative technologies for critical mineral processing. Minerals can be extracted, refined and processed in Latin America, and the final high-value goods can then be exported globally. Specific industrial zones that provide tax holidays, cheap land, and subsidized water, electricity, and effluent treatment plants will enable the creation of a full-fledged ecosystem within Latin America.

### **3. Leverage the potential of regional cooperation to promote supply chain diversification**

In order to develop a North-South framework for RD&D collaboration, upskill the workforce to benefit local communities, ensure technology transfers, and strengthen technical assistance across the whole supply chain, regional cooperation is imperative. Competition is increasingly defining diplomatic engagement in countries driving the energy transition, evidenced by the United States' IRA and the European Union's Carbon Border Adjustment Mechanism (CBAM). By acknowledging Latin America's geoeconomic advantages to serve as a global hub for critical minerals, the G20 should adopt a regional cooperation approach to localize and value critical minerals supply chains in the region.

China dominates global critical mineral production and countries relying on refined materials are concerned with this dependency, which could deepen energy security risks. As of 2022, China was responsible for refining 68% of nickel globally, 59% of lithium, 40% of copper [13], placing themselves ahead in the midstream and downstream race. With state-led incentive programs to process and refine minerals, the Chinese offered options that ranged from upfront subsidies to low-interest loans given by regional governments.

However, as mentioned before, Latin America has the upstream advantage for these minerals and could unlock a large global market if the right incentives were put into place. Strategic regional alliance in Latin America would be instrumental in facilitating a coordinated approach to mining and refining of critical minerals. By pooling resources and knowledge, countries in the region can elevate their collective bargaining power on

the global stage and will be able to negotiate more effectively with international markets and corporations.

Through collaborative agreements, the regional alliance would focus on joint research and development projects, shared infrastructure investments, and collective bargaining in international trade negotiations. By presenting a united front, Latin America can leverage its collective resource base to secure more favorable terms and access to technology. Joint ventures could also serve as a potential solution to attract investments. These ventures could focus on developing advanced refining and manufacturing facilities locally, leveraging international expertise and investment to build capacity and reduce technological gaps. Encouraging collaboration between governments and the private sector is key to driving investments in mining and processing infrastructure. These partnerships can facilitate the introduction of cutting-edge technologies and sustainable mining practices, further enhancing the competitiveness of the Latin American mining sector.

To ensure compliance, Latin America should introduce incentives for operations that adhere to high standards, including tax benefits, access to green financing, and support for adopting sustainable technologies. These measures would encourage practices that are environmentally responsible and socially equitable, addressing key concerns surrounding mining activities in the region and positioning Latin America as a competitive player in the global mining sector.

## Conclusions

The growing demand for critical minerals in the energy transition context poses a great opportunity for resource-rich countries in Latin America. However, harnessing this opportunity would require additional policies and investments to strengthen the industry beyond the upstream extraction.

Implementing a more robust cooperation scheme between developed and developing nations for “capacity development” would be mutually beneficial. Developing countries would benefit from technology and skills transfers for this industry and the spillover effects in other sectors, achieving greater socioeconomic development. Developed countries would benefit from more diversified supply chains, decreasing the risks and costs of obtaining critical minerals.

Although harder to achieve, regional cooperation would be a major enabler of supply chain diversification. Developing hubs for refining and manufacturing by coordinating policies and fostering investments in energy supply, shared infrastructure, and trade corridors, would create economies of scale and incentivize investments in this industry.

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