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South America amid hegemonic narratives of critical minerals and the corporate energy transition

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ABSTRACT

From a critical South American perspective, this article analyzes how global actors contest and control hegemonic narratives about critical minerals and the so-called Corporate Energy Transition. Using an exploratory, mixed-methods approach, this study examines the geopolitical dimensions of these minerals in the global energy transition. The methodology draws on international organization reports, a comprehensive literature review, and my previous research. Results demonstrate that the corporate energy transition reproduces a framework of "green neocolonialism" under the guise of decarbonization. This process shifts structural dependence from fossil fuels to a multi-dependency on critical minerals, thereby deepening neo-extractivism across the Global South. In this context, I argue that South America faces the urgent challenge of redefining how its strategic resources are used and controlled. The region must overcome its subordinate global position and realign the energy transition with its own sovereign development priorities.

KEYWORDS: South America, critical minerals, corporate energy transition.

INTRODUCTION

The ongoing climate crisis has intensified debates about transforming the global energy system. This intensification reflects more frequent extreme weather events and the cumulative impacts of current extractive models, both of which demand urgent, mandatory changes. Multiple studies warn that extracting and processing natural resources—both renewable and non-renewable—accounts for a substantial share of global greenhouse gas (GHG) emissions. Recent estimates from the International Resource Panel (2024) place this figure above 55%. However, dominant climate discourses rarely problematize the historical and geographical distribution of those responsible for these emissions.

According to the Intergovernmental Panel on Climate Change (IPCC, 2021), global GHG emissions are heavily concentrated in a few economies. Organization for Economic Co-operation and Development (OECD) member countries contribute approximately 33.6% of the total, while China accounts for nearly 29.5%. Together, they account for more than 60% of global emissions. In contrast, non-OECD countries contribute significantly less; South America's share, for instance, does not exceed 2.8%. Dominant climate change discourses consistently obscure this sharp asymmetry in historical and current responsibility.

This article builds on and expands my previous research (Guerrero, 2023b, 2024a, 2024b). It examines how the hegemonic narrative driving the low-carbon transition focuses heavily on the recent rise in GHG concentrations while deliberately omitting key debates about the historical responsibility of major emitters and the atmospheric persistence of these gases. This erasure depoliticizes the climate dilemma. It frames the energy transition as a neutral, homogeneous process aimed simply at promoting clean energy and electromobility.

Sunlight and wind are cost-free flows. However, converting them into industrial energy requires physical infrastructure, such as wind turbines and photovoltaic panels. Developing these technologies requires critical minerals, including silicon and rare-earth elements. Consequently, implementing a low-carbon transition requires substantial financing for infrastructure investments and access to new technologies that convert solar and wind energy into electricity.

A defining feature of the current energy transition is its investment focus. Capital targets the infrastructure needed for energy conversion and transport rather than primary energy sources themselves. REN21 (2018) reports characterize this process as predominantly an electrical transition because the most profound transformations occur in this sector. Large-scale electrification also requires a significant expansion of transmission grids, increasing demand for copper and other minerals. Hund et al. (2020) estimate that generating and transporting wind and solar energy requires extracting billions of tons of minerals and metals. This reality demonstrates that the transition to low-carbon systems intensifies the extractive metabolism associated with critical minerals.

These figures highlight skyrocketing mineral consumption when the full footprint of the "clean energy transition" is factored in. Thus, the low-carbon transition is directly linked to the growing importance of critical minerals. Furthermore, to curb GHG emissions and strengthen this transition in the transport sector, policymakers heavily favor electromobility, accelerating the expansion of electric vehicle fleets and public transit systems. Consequently, the demand for lithium—essential for battery storage—surges alongside a broader array of minerals than in conventional automobiles.

Within this framework, the contemporary energy transition aims to reduce GHGs and shift toward low-carbon technologies. This duality sparks fierce competition among global actors seeking to secure supply chains for the critical minerals essential to modern green technologies.

These dynamics underscore two central narratives promoted by global actors: the absolute necessity of critical minerals to sustain the transition and the existence of a single, universal energy path—the "corporate energy transition." I use this phrase as an analytical concept. It characterizes how corporations inflate positive environmental data, creating a distorted, biased image of reality to appear "green" or "clean" when their core activities are not.

This article builds on my previous research through a critical lens. Drawing on alternative perspectives from regional scholars, I expose and confront the "shadows" hidden behind dominant narratives. The analysis offers a situated perspective grounded in South American reality. Global actors such as the United States, the European Union, and China seek to control corporate narratives about the energy transition. They market it as a uniform phenomenon common to all nations. Conversely, I contend that no single transition exists. Instead, we face multiple, distinct "energy transitions." Transformations unfold across sectors, draw on diverse sources, and progress at varying speeds, depending on each country's historical trajectory and resource availability.

Furthermore, this dominant narrative uses labels such as "clean" or "green" to highlight only the final stage of the corporate energy transition value chain. It glosses over the full ecological footprint of mineral extraction, which is indispensable for building the infrastructure that converts wind and sunlight into electricity. This obfuscation enables the second narrative regarding critical minerals. Global actors, notably the United States and the European Union, reinforce the discourse of mineral "criticality." They compile restrictive lists to secure their own energy and mining security. However, they fail to acknowledge that the minerals they classify as critical are already strategic resources held by South America and China.

China's leadership in green technologies, coupled with its vast deposits of critical minerals—particularly rare earth elements—and its near-monopoly on mineral processing, reveals sharp fractures among global powers. This imbalance fuels intense competition for resources, transforming South America into a primary arena of geopolitical dispute.

In this scenario, global powers such as the United States and the European Union strive to control both access to critical minerals and the narrative of the "green" energy transition. By wielding these dual narratives, they shift the global system from dependence on "dirty" fossil fuels to a corporate energy transition that imposes a new multi-dependency on critical minerals (Guerrero, 2023a).

South America must confront both narratives with sovereign alternatives that expose local socio-environmental impacts. The scramble for critical minerals, the indispensable inputs for the Global North's corporate "green technologies", expands with blatant disregard for the territories bearing the brunt of extractivism. Competition intensifies over resources concentrated in South American nations. The region holds vast reserves of lithium and copper, which are vital for the electrification of transportation and energy storage. It also contains nickel and niobium, concentrated in marginalized territories where water conflicts, cumulative socio-environmental impacts, and weak public participation mechanisms persist.

This context facilitates the reproduction of historical dynamics of subordinate extractivism and green neocolonialism. Furthermore, global and regional power relationships become highly asymmetric because mineral refining and processing capacities are heavily concentrated in a single nation that also holds technological leadership in the energy transition: China.

This landscape reveals a conflict arena dominated by three global power centers. First, the United States and the European Union, which, in their turn, contest access to critical minerals, are integrating these resources into defense white papers and diplomatic negotiations. For instance, US President Donald Trump's 2025 demand for access to Ukrainian rare-earth elements in exchange for financial support exemplifies this behavior. The second, China, leads in producing low-carbon technologies, holds substantial reserves of minerals deemed critical by the US and EU, and dominates global processing. Consequently, resource “criticality” does not apply to China in the same way. This disparity intensifies the geopolitical struggle in resource-rich regions as Western actors scramble to secure access.

The entanglement of actors and resources underscores a complex struggle that is not just geopolitical but also geoeconomics. Global capital targets specific countries possessing these minerals based on a logic of territorial selectivity, focusing on cost efficiency, political stability, and social license. These global resource disputes directly drive the penetration of global powers into South America.

Drawing on a geopolitical and geoeconomic framework, this article analyzes how global actors shape hegemonic narratives around both critical minerals and the Corporate Energy Transition. Writing from a critical South American perspective, I expose the contradictions inherent in the mainstream model and propose alternatives to the singular transition paradigm. Furthermore, I shed light on the challenges posed by an increasingly extractivist energy transition driven by large-scale mining operations, which yield severe environmental and social impacts.

Methodologically, this exploratory research addresses an emerging topic in energy transition studies. The study adopts a mixed-methods design. Quantitative components draw on data from reports compiled by international bodies, including BP, the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), and the Latin American Energy Organization (OLADE). Qualitative components ground the problem in my previous research and a rigorous literature review of South American scholarship. As an analytical framework, I deploy the multiscalar, multidimensional approach of the New Political Geography to contextualize the issue across scales, focusing on the geopolitical, geoeconomic, social, financial, and technological dimensions.

The article features an introduction, three main sections, and final reflections: Section 1 unpacks the conceptual aspects of the corporate energy transition from a critical South American perspective. Section 2 distinguishes strategic resources from critical minerals, asking: critical for whom? Section 3 maps the regional positioning of the three primary global actors: the United States, the European Union, and China. Despite its self-identification with the Global South, China requires specialized analysis given its deep penetration into South America as the dominant supplier of key transition technologies such as solar panels, batteries, and electric vehicles. The Final Section offers concluding remarks.

CONCEPTUAL CLARIFICATIONS WITHIN THE ENERGY TRANSITION NARRATIVE: A CRITICAL SOUTH AMERICAN PERSPECTIVE

Across Latin America, and particularly within South America, several scholars propose a critical paradigm for a sovereign and just energy management system tailored to the Global South. This framework requires deconstructing and clarifying concepts "instituted or imposed" by the Global North's hegemonic and corporate narratives. The mainstream energy transition discourse rests on two central pillars: achieving net-zero carbon emissions and transitioning transport systems to electromobility in a post-fossil-fuel world (Guerrero, 2024b). Crucially, analysts must expose the power dynamics behind these narratives before unpacking the global struggle over critical minerals.

A vital starting point is to expose the "shadows of the energy transition." Through repetitive rhetoric, mainstream narratives actively obscure ongoing material realities. A prime example is the clean/dirty dichotomy, which forms part of a corporate effort to "sanitize" fossil capitalism. Similarly, the indiscriminate use of the term "green" to describe solar and wind energy amounts to extensive greenwashing.

Corporate actors widely deploy greenwashing as a discursive strategy to construct an environmentally responsible image that contradicts their actual practices. Beyond its formal inclusion in dictionaries, authors emphasize its political function: manufacturing disinformation and shifting public focus from structural impacts to the symbolic attributes of sustainability (Alejos Góngora, 2013; Greenpeace, n.d.). The South American Grupo de Geopolítica y Bienes Comunes (Geopolitics and Common Goods Group—GYBC, 2021, led by Fornillo) terms this corporate framing the "Corporate Energy Transition." Under this mechanism, corporations inflate positive environmental data, engineering a distorted, biased reality that makes them appear green while their core activities remain destructive.

Recent debates published in the Brazilian journal *Diálogos Socioambientales* (2025) challenge a core assumption of the corporate energy transition: the existence of intrinsically "clean" energy sources. By problematizing United Nations Sustainable Development Goal (SDG 7)—Affordable and Clean Energy—and its normative categories, these authors expose the friction between global sustainability discourses and localized socio-environmental conflicts in Latin America.

Specifically, Vieira Lisboa (2025) dissects the use of the adjective "clean" alongside equally vague descriptors such as "green," "renewable," or "sustainable." This critique draws from the concrete territorial experiences of environmental justice movements. These grassroots groups reject corporate terminology based on their lived experiences in areas degraded by these energy installations. Because the most affected populations comprise politically and economically marginalized groups, corporate narratives routinely conceal the less visible environmental and social costs borne by these communities.

"This shift in perspective is most evident in dam-based hydroelectric power. Historically, scholars categorized hydroelectricity as a 'clean and renewable' source in contrast to 'dirty' thermoelectric plants. Today, however, analysts classify only small-scale dams as clean, given the severe socio-environmental degradation caused by large-scale reservoirs."

Berman et al. (2025) expand this critique by arguing that a true energy transition is not actually occurring, since traditional energy sources remain heavily in use. They correctly note that solar and wind power do not replace fossil fuels. Instead, they merely expand the overall energy portfolio as total global energy demand rises. Other critical perspectives supplement this view. Scholars emphasize that the contemporary energy transition is creating a highly technical, knowledge-intensive energy industry that commodifies renewable sources. For semi-peripheral or developing nations, this dynamic fosters deep dependence on external financing and foreign technology while accelerating mineral consumption and fueling extractivism.

Regarding lithium, Fornillo and Argento (2025) offer a critical analysis of the symbolic construction surrounding its extraction in South America. The authors illustrate how images promoted by corporate "technological art" depict salt flats (salares) as empty, sterile landscapes dominated by light aesthetics and turquoise waters. This imagery stands in stark, calculated contrast to the dark, toxic representations associated with the fossil fuel world. This visual manipulation erases existing biodiversity, fragile ecosystems, and the local populations who inhabit these territories and depend on subsistence economies amid acute water scarcity.

Consequently, lithium extraction appears detached from its socio-environmental tolls. This erasure reinforces a narrative that legitimizes extractivist expansion. For this reason, the authors label lithium an ideological artifact and a distinct worldview. Critical scholars note that corporate discourses systematically avoid discussing the need for structural changes to development models that would reduce consumption. Instead, they entrench the narrative of an eco-friendly citizen living in a solar-powered world run on batteries and electric vehicles.

This narrative "leads to the belief that wealth resides in lithium itself, ignoring that it is merely a component of a battery that stores energy rather than generating it." (Fornillo and Argento, 2025, p. 110) Within this structure, Argentine and Chilean lithium is exported purely as low-value lithium carbonate. Both nations remain largely excluded from controlling the global value chain that runs from salt flats to battery manufacturing.

A key factor in electromobility is that electric cars require a wide array of minerals beyond the lithium used in their batteries. These vehicles use six times as many minerals as a conventional automobile. For instance, a hybrid car can contain 9 to 11 kg of rare earth elements and between 40 and 60 kg of copper, which is twice the amount used in internal combustion engine vehicles. Furthermore, lithium-ion batteries are exceptionally heavy; they consist of 80% nickel, 15% cobalt, and 5% aluminum, and also contain lithium, copper, manganese, steel, and even graphite (López Jimeno and González, 2022, p. 112).

These data illustrate the relationship between the corporate energy transition and critical minerals in the transport sector to advance electromobility. On the one hand, an electric car requires a high consumption of various minerals, despite being widely perceived as "clean and environmentally friendly." On the one hand, electromobility becomes the flagship image of green capitalism orchestrated by global actors (ECLAC, 2024).

Analyzing the entire value chain reveals the significant involvement of global actors in the corporations that extract battery-grade lithium. This includes US firms such as Albemarle and Livent Corp, Australia's Orocobre, and China's Ganfeng. Furthermore, Chinese enterprises control 50% of battery manufacturing destined for automotive plants. At the end of the chain sit transnational automotive giants like Toyota, BMW, VW, Audi, Nissan, and General Motors, alongside energy firms such as Vestas and Tesla (Bringel and Svampa, 2023).

These concrete parameters reveal the deeply subordinate position of South America and the broader Global South. While Global North corporations, foundations, and governments heavily market "clean energy," they externalize its costs. For China, the United States, and Europe to decarbonize, peripheral and semi-peripheral regions must become sacrifice zones that bear the socio-environmental devastation of escalating extraction.

Accordingly, critical scholars characterize the corporate energy transition as a new phase of global extractivism, labeling it 'energy colonialism' or 'green extractivism'. Within this framework, Bringel and Svampa (2023) introduce the term "Decarbonization Consensus." This concept describes a global capitalist accord that promotes a partial replacement of fossil fuels with renewables without structurally altering hyperconsumption patterns or capitalism's predatory relationship with nature. At the same time, it cements the peripheral status of vast territories across the Global South.

In short, critical researchers argue that this imposed framework constitutes an "accumulation by decarbonization" (Anigstein et al., 2022; Lang, Bringel, and Manahan, 2023; Svampa and Bertinat, 2022). This mechanism preserves the capitalist accumulation model and its ideology of indefinite economic growth. Under the pretext of climate urgency, it enforces the corporate energy transition as the sole viable solution, deliberately erasing multiple alternative paths.

Consequently, energy transitions serve as an arena of competing ideologies and agendas. Certain states impose an ahistorical, partial discourse that reflects only Global North perspectives, thereby ignoring the social, political, and economic inequalities between the Global North and the Global South. It likewise overlooks localized internal conflicts, distinct needs, and regional vulnerabilities (Guerrero, 2024b). Acknowledging diverse structural starting points validates the existence of plural energy transitions. Real-world transition pathways vary in speed, mechanics, and sectoral focus across different countries, regions, and sectors, rather than following a single trajectory.

Therefore, the energy transition must be a situated experience that recognizes the specific challenges and opportunities based on each nation's domestic resources. Amid escalating competition among global actors for access to critical minerals, South American countries must leverage their possession of these strategic resources. By negotiating from a position of strength, they can secure technology transfers or sovereign financing to define their own development models.

Conversely, an alternative South American perspective demands a deeper, more complex transformation of the energy matrix. This paradigm requires models that depart from capitalist extractivism and dynamically link social justice with environmental justice. Such an alignment counters the hegemonic narrative of a single transition imposed via the "coloniality of power," as argued by Quijano (2000) and Rativa-Gaona (2021, 2022).

South America's immediate hurdle is fundamentally political rather than technological. At the COP30 summit hosted by Brazil in November 2025, the region must decisively reject hegemonic discourses. Instead, it must build a highly cooperative regional strategy that anchors energy and productive sovereignty to social and ecological metrics, moving away from neo-extractivism, corporate transition templates, and green neocolonialism. Regrettably, from the vantage point of this writing, the geopolitical outcomes of COP30 offer little cause for optimism.

CRITICAL MINERALS OR STRATEGIC RESOURCES: FOR WHOM?

Within this critical framework, the corporate energy transition cannot be analyzed solely based on its stated decarbonization objectives, but also on its concrete material requirements. The rising demand for specific minerals to sustain this model constitutes a central dimension of contemporary disputes, exposing asymmetric relations of power, access, and resource control between the Global North and the Global South.

The previous section incorporated concepts under discussion in South America from a critical perspective, allowing us to interrogate a core material dimension of the corporate energy transition: the narrative of so-called critical minerals and its purported universality. Specifically, one must ask whether these minerals are truly critical for all territories and actors, as dominant corporate narratives suggest, or if their criticality is restricted to countries lacking a sufficient domestic supply. To address this question, it is necessary to clarify the concepts of natural resources, strategic resources, and critical minerals, and to position them within their geopolitical context.

From a geopolitical perspective, natural resources are environmental elements that acquire the capacity to satisfy human needs under specific historical, technological, and social conditions. However, not all natural resources attain a strategic character. This status arises when global availability is limited, territorial localization is specific, and control is concentrated among a small number of actors. Within this framework, conflicts associated with a resource do not derive solely from physical scarcity but also from interstate asymmetries in access, protection capabilities, and control, introducing a geopolitical dimension into international valuation (Guerrero, 2016).

Conceptualizing natural resources as instruments of power aligns with the contributions of New Political Geography, which links resources to the formulation of state strategies aimed at guaranteeing control and access. From this perspective, the geopolitics of natural resources asserts that certain resources acquire a strategic character to the extent that they can become drivers of political, economic, or military conflict. These conflicts emerge from the tensions inherent to the processes of use, appropriation, and management of the resources a state possesses within its territory (Méndez, 2006; Burdman, 2019).

In this context, the term “critical minerals” refers to inputs whose supply is at significant risk of disruption. This vulnerability can stem from geological limitations as well as economic, technological, or geopolitical restrictions that prevent meeting domestic demand. A mineral acquires a critical character when the probability of shortages and their subsequent economic and productive impacts outweigh the risks associated with other inputs, particularly in specific industrial sectors that depend on their intensive use (Zaar, 2024).

Growing concern over the security of supply chains for essential minerals and materials is closely linked to the expansion of so-called “clean” energy, the development of technologies associated with the Fourth Industrial Revolution, and the development of security and defense systems. In this scenario, accessing critical minerals has become a strategic issue for major economic powers, as they face vulnerabilities stemming from their reliance on raw materials key to national security and economic competitiveness (Hidalgo García, 2022).

These preceding definitions introduce a pivotal distinction for the South American debate. In the region, several minerals, globally classified as critical, such as lithium and copper, are not scarce but rather constitute abundant strategic resources. Consequently, their strategic nature does not stem from supply criticality, but rather from the sovereign capacity to manage them in accordance with the development projects, capabilities, and interests of the host nations.

In this regard, Zaar (2024) notes that the concept of criticality is dynamic. It varies not only with resource scarcity but also across multiple factors that affect the risk of supply disruption, such as the timeframe analyzed, the country involved, specific industrial characteristics, and market complexity, including producer concentration, demand, pricing, regulatory shifts, and the geopolitical situation of supplier countries. Likewise, mining development depends on infrastructure as a lever to ensure project competitiveness, encompassing highways, high-voltage lines, and railways, along with their respective construction timelines. Finally, technological innovation poses another hurdle, as new developments may render certain minerals obsolete.

These same resources take on a different meaning within the framework of global geopolitical competition. These same resources acquire a completely different meaning within the arena of global geopolitical competition. While producer nations like China view them as strategic resources under national control, actors like the United States and the European Union classify them as critical minerals due to the risk of supply chain disruptions that could affect the manufacture of energy transition technologies and advanced defense systems. Consequently, international reports, such as those by the International Energy Agency (IEA), reflect the growing centrality of critical minerals within the energy and security strategies of major global powers (IEA, 2022; IEA, 2025).

These conceptual clarifications allow us to understand that the criticality of a mineral is not an intrinsic or universal condition, but a situated political and geopolitical construct, which depends on the productive, technological, and security needs of each State or regional bloc. For instance, the December 2025 defense directives issued by the North Atlantic Treaty Organization (NATO) list 12 “critical raw materials” for defense, a selection also adopted by the European Union (EU). This list includes aluminum, beryllium, cobalt, gallium, germanium, graphite, lithium, manganese, platinum, rare-earth elements, titanium, and tungsten. The compilation emerged from a June 2024 meeting of NATO defense ministers, who agreed on a “Defense Critical Supply Chain Security Roadmap” designed to protect defense industries, mitigate strategic dependencies and vulnerabilities, and safeguard military capability development from the influence of potential adversaries, particularly China.

Within the framework of the corporate energy transition, the European Union also recognizes the risks of dependence on critical minerals. European Commission President Ursula von der Leyen explicitly highlighted this in her 2022 State of the Union address, noting that lithium and rare earths would soon become more important than oil and gas, and predicting that EU demand for rare earth metals would quintuple by 2030. Within the European sphere, rising concern about reliance on critical minerals led to a series of regulatory initiatives to strengthen the bloc’s strategic autonomy.

In this context, the European Union adopted the Critical Raw Materials Act (CRMA), which entered into force in May 2024. This legislation establishes quantitative benchmarks for 2030, requiring 10% of extraction, 40% of processing, and 25% of recycling to occur within European territory, while capping dependency on any single third-party supplier at 65%. The regulation aims to reduce structural vulnerabilities across strategic sectors, particularly those tied to the energy transition and the defense industry (ISE, 2024).

The objective of this portfolio of forty-seven projects is to reduce EU reliance on foreign sources while bolstering domestic extraction, processing, recycling, and substitution capacities for essential materials. Backed by a planned capital investment of 22.5 billion euros, the EU targets projects covering fourteen of the seventeen raw materials classified as strategic. These initiatives encompass resources essential for manufacturing electric vehicle batteries and other green technologies, including lithium (22 projects), nickel (12), cobalt (10), manganese (7), and graphite (11). Additionally, other projects address raw materials necessary for the defense industry, such as magnesium and tungsten (La Región, 2025).

Similarly, as an institutional expression of the Decarbonization Consensus and the Corporate Energy Transition, the United States policy regarding critical minerals consolidated after 2017 with an explicit focus on national security. Executive Order 13817 defined these minerals as inputs essential to the economy and national defense whose supply chains are highly vulnerable. Based on this definition, the government compiled an official critical minerals list, acknowledging the country's severe foreign reliance on several of them. The Department of the Interior published a final list of thirty-five critical minerals in May 2018. US authorities view this dependency as a strategic risk, particularly amid escalating geopolitical competition with China.

US mining policy emphasizes developing domestic supplies of critical materials and encouraging the private sector to produce and process them. However, certain raw materials are not available in economically viable quantities in the United States. Consequently, the country relies entirely on imports for fourteen of the thirty-five critical minerals affecting its national security, including graphite, manganese, niobium, rare earths, and tantalum. Furthermore, the United States relies on net imports of over 75% for ten other critical minerals, including antimony, barite, bauxite, bismuth, potash, rhenium, tellurium, tin, titanium, and uranium.

Regarding reliance on net imports and critical minerals, President Trump declared a national emergency in September 2020 over the "unacceptable dependence of the United States on foreign adversaries for critical minerals," a veiled reference to China. In a similar vein, during a 2022 visit to Chile and Argentina, the Commander of the Fourth Fleet of the South Atlantic, Laura Richardson, explicitly highlighted the strategic importance to the United States of South American resources, including lithium, copper, water, and biodiversity.

According to 2024 data from the United States Geological Survey (USGS), a single producer nation dominates the global supply of several critical minerals. Brazil produces 88% of the world's niobium; the Democratic Republic of the Congo (DRC) accounts for 71% of global cobalt; and South Africa dominates platinum group metals. China supplies 49% of rare earth elements (including yttrium), controls over 70% of global production, and accounts for nearly 90% of processing capacity. Furthermore, Southern Africa is the dominant producer of chromium, manganese, platinum group metals, tantalum, and cobalt, while Australia accounts for 58% of global lithium production.

In synthesis, this analysis demonstrates that the category of critical minerals is neither universal nor static. Instead, it depends on the geopolitical positioning of states, their domestic resource endowments, and their integration into global value chains. From a South American perspective, this differentiation remains pivotal to challenging hegemonic energy transition narratives and rethinking the role of regional strategic resources within a global landscape defined by renewed struggles over the control of energy and minerals.

From this perspective, the notion of critical minerals gains full analytical clarity when examined within the framework of geopolitical competition among major economic powers. Within this arena, concrete disputes unfold over access, control, and security of strategic resources. This dynamic directly implicates South America as a primary supplier territory, an issue explored in the following section.

SOUTH AMERICA, THE UNITED STATES, THE EUROPEAN UNION, AND CHINA IN THE SCRAMBLE FOR RESOURCES

The global struggle over critical minerals unfolds across two core dimensions of the contemporary energy transition: the deployment of renewable energy and electromobility, and their utilization within security and defense sectors. Within this framework, reports from the United States Geological Survey (USGS) illustrate South America's role as a supplier of strategic inputs for major industrial economies.

According to a 2019 USGS summary, the United States imports a wide array of minerals from South America that are vital to its industrial architecture. Key imports include: Niobium (72%), sourced from Brazil, it is indispensable for manufacturing specialty steels and superalloys; lithium, imported from Argentina (51%) and Chile (44%) for rechargeable batteries, ceramics, glass, and chemical compounds; tantalum (35%), sourced from Brazil for electronic capacitors; bauxite (25%), sourced from Brazil as the primary aluminum ore; tin, sourced from Peru (22%) and Bolivia (17%) for chemicals, tinplate, solders, and alloys; vanadium (13%), sourced from Brazil for steelmaking and aerospace applications; tungsten (9%), sourced from Bolivia for cutting tools and wear-resistant materials used in metallurgy and construction. This import architecture underscores the strategic role the region plays in supplying essential minerals to the US economy.

Concurrently, the same report measures the structural dependency of the United States on China. A significant share of critical minerals imported by the US economy either originates in China or is heavily concentrated within its supply chain, as demonstrated by the import percentages and applications of the following products: arsenic (91%), bismuth (80%), barite (63%), antimony (61%), germanium (58%), natural graphite (37%), tungsten (32%) for cutting tools and wear-resistant materials in construction and metallurgy, gallium (32%) for integrated circuits in high-tech equipment, light-emitting diodes (LEDs), and solar cells, indium (27%) for electrical conduction, liquid crystal displays (LCDs), and photovoltaic cells, tellurium (27%) for solar panels and thermoelectric devices, cobalt (12%), and vanadium (10%) for steelmaking and aerospace applications. This asymmetric reliance is especially stark in the case of rare earth elements (80%), which are indispensable for manufacturing the permanent magnets used in wind turbines, electric vehicles, and defense systems.

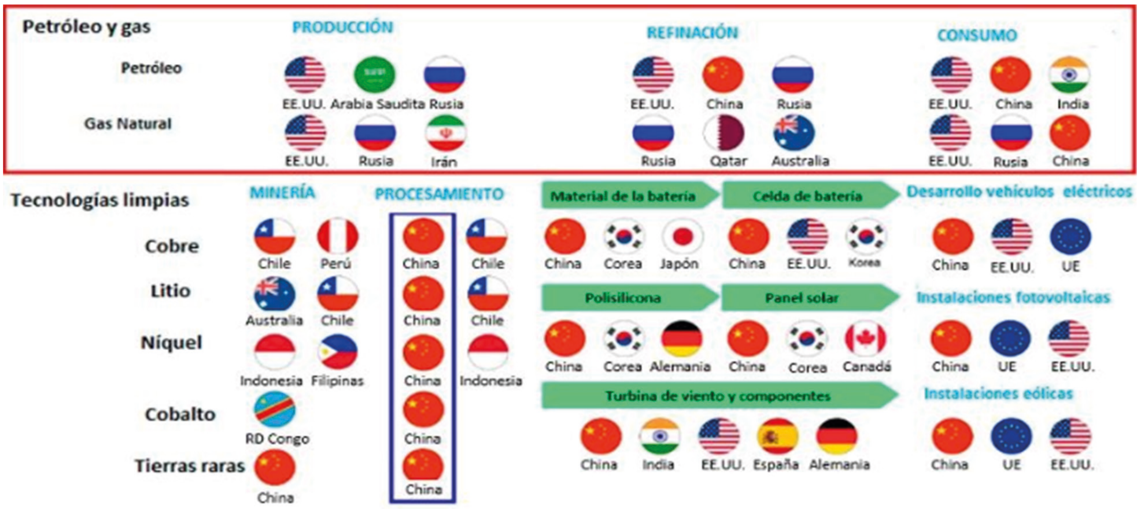
This dual dependency—on South America as an extraction zone and on China as the dominant refining powerhouse—reveals that competition over critical minerals transcends a simple North-South divide. It structures systemic tensions among global powers, confirming that criticality is not an intrinsic property of resources. While China controls many of these inputs within its sovereign sphere, the United States and the European Union classify them as critical due to the systemic risks posed by supply disruptions.

This US dependency demonstrates that global actors contest mineral supply chains precisely because China holds a unique geoeconomic advantage; it possesses these strategic resources domestically, meaning they do not constitute critical vulnerabilities for Beijing. However, Chinese producers not only seek to expand their domestic production capacity but also continue to negotiate long-term supply contracts or capital partnerships worldwide, particularly in Africa (cobalt and tantalum), Australia (lithium), and South America (lithium), as they need more resources to increase production.

In this context, the Chinese case requires specialized analysis. China has consolidated a hegemonic position across the extraction, refining, processing, and final manufacturing stages. Regarding rare earth elements, data from the USGS and the Benchmark Rare Earths Forecast reveal that while global mined supplies multiplied sixfold between 1994 and 2024, China consistently maintained its dominance. This near-monopoly allows Beijing to weaponize these resources as a form of geopolitical leverage. For instance, China imposed export restrictions under national security pretexts in April 2025 in response to tariffs announced by the Trump administration, followed by a tariff-reduction truce.

China's centrality extends vertically across the global value chains for energy transition technologies. Its leadership in manufacturing solar panels, batteries, electric vehicles, and wind turbines relies on massive state subsidies and deep vertical integration. Since 2011, China has invested nearly 50 billion dollars to expand its solar manufacturing infrastructure, ten times more than Europe (IEA, 2022). As a result, Chinese firms dominate the global wind and solar markets. Among the top fifteen global wind turbine manufacturers, China's Goldwind claimed the top spot, displacing Denmark's Vestas from its historical leadership position (Wood Mackenzie, 2023). In the solar sector, China controls 75% of global polysilicon production, 97% of the solar wafers used to manufacture crystalline solar cells (of which it controls 79%), and 85% of final module assembly (IRENA, 2020).

Figure 1 – China in the Contemporary Energy Transition Global Value Chain



Source: Based on Guerrero, 2024a, adapting International Energy Agency, 2022 data

The Figure 1 illustrates China's role in upstream oil refining and the extraction of rare earths, midstream processing of minerals for clean technologies, and downstream production of batteries, electric vehicles, solar panels, and wind installations.

Within this framework, China has also become Latin America's primary mining partner. Backed by long-term financing mechanisms, concessional loans, and targeted asset acquisitions, China rapidly expanded its footprint across the regional mining, energy, and infrastructure sectors starting in the mid-2000s. Between 2005 and 2014, Chinese investments in the region surged from 231 million dollars to 22.1 billion dollars, consolidating a structural presence within South American economies (Gallagher and Myers, 2014). Subsequent research confirms this trend, showing capital tightly concentrated in energy and mining infrastructure (Fuser and Almeida Ferreira Abrão, 2020). Data from the *China Global Investment Tracker* supports this, reporting that China injected 101.25 billion dollars into South American energy ventures between 2005 and 2020.

However, the strategic relevance of these resources depends on more than physical existence; it hinges on accessibility, regulatory policies, and the technical, environmental, and social conditions of extraction. Mining projects carry high capital costs, long development lead times, and acute socio-environmental risks that frequently clash with the immediate timelines of global demand.

In China's case, locating rare earth deposits within clay formations, combined with historically lax regulatory frameworks, yielded comparative advantages that are difficult to replicate. These conditions reinforce Chinese leadership in the energy transition while escalating geopolitical frictions with the US and the EU, particularly given past instances in which Beijing has used strategic minerals as diplomatic leverage. The battle to control these inputs is thus locked into a long-term logic of economic and geopolitical security.

From the European perspective, the European Commission acknowledges a severe import reliance on strategic minerals and critical raw materials from South America—specifically niobium and iron from Brazil; lithium, copper, and molybdenum from Chile; lithium from Argentina; and silver, zinc, molybdenum, and tin from Peru (European Commission, 2020). This vulnerability explains the EU's recent drive to sign memoranda of understanding (MoUs) across the region, aimed at securing access to raw materials and diversifying suppliers within a strategy of open strategic autonomy.

Consequently, the MoUs signed between the EU and Argentina in 2023 and between the United States and Argentina in 2024 represent concrete manifestations of this global competition. Both agreements seek to deepen cooperation across the entire critical mineral value chain—from exploration to recycling—with the explicit goal of cutting foreign dependencies, particularly on China.

The MoU signed by the EU and Argentina on June 13, 2023, explicitly establishes a strategic partnership to support the clean energy and digital transitions through sustainable raw-material value chains. It recognizes that securing a stable supply of the strategic and critical raw materials listed in its annex is a prerequisite for achieving these goals. This annex comprises two lists: 16 Strategic Raw Materials and 34 Critical Raw Materials. The ultimate objective is to develop open, resilient, and competitive markets for processed and recycled raw materials, allowing the EU to diversify its supply chains and safeguard its open strategic autonomy (Memorandum de Entendimiento Argentina-UE, 2023).

Similarly, Argentina and the United States signed an MoU on Critical in August 2024. This agreement seeks to stimulate investments and joint ventures in lithium, copper, and rare earth value chains. The cooperation spans every stage: geological exploration, extraction, processing, refining, industrialization, and recycling. Furthermore, the MoU established a bilateral Energy Security Dialogue, a permanent mechanism designed to share information and coordinate initiatives to guarantee a reliable, diversified supply of strategic minerals (Argentina-United States Memorandum of Understanding, 2024).

From the US perspective, the strategic objective is clear: reduce its reliance on Chinese inputs for domestic industries. Yet this strategy must confront the reality that Chinese firms already hold a commanding presence in South American mining operations.

This landscape confirms that the contemporary energy transition unfolds as an arena of intensifying geopolitical competition. While some countries possess strategic resources in abundance, others define them as critical vulnerabilities and scramble to secure access via diplomatic, financial, and commercial statecraft. As Vera García (2025) notes, mineral security is increasingly bound to the political and geopolitical dynamics traversing the mining sector.

A central divergence among these actors is that China's resource strategy focuses on expanding its productive and processing capacities, whereas the United States and the European Union focus on mitigating vulnerabilities and securing energy and mineral supplies. This asymmetry explains China's structural leadership in the transition and the underlying tensions dividing the critical mineral market. Ultimately, this analysis demonstrates that resource criticality is relational and situated. It manifests through diverse mechanisms, including trade agreements, infrastructure investments, sovereign loans, diplomatic pressure, energy security discourses, and a physical military presence.

The contemporary energy transition is not a neutral or homogeneous process, but a battleground where strategic minerals occupy center stage. This dynamic raises profound questions about South America's structural role and geopolitical autonomy. Moreover, the region's leverage to build sovereign alternatives against a corporate-led transition is now on trial.

CONCLUDING REMARKS

Building on the observations in the previous sections on conceptual precision, the characterization of critical minerals, and the analysis of existing dependencies between major global actors and South America, one can affirm that dominant narratives about critical minerals and the corporate energy transition actively obscure the power relations that structure this process. Within this framework, the idea of inhabiting a world sustained exclusively by renewable and "clean" energy functions more as a discursive construction than as a material transformation of the prevailing economic and productive model.

As developed in the first section, the corporate energy transition markets itself as a process geared toward decarbonization. Its analytical focus is on the final stage of the value chain, deliberately omitting the initial extraction phase and the severe socio-environmental impacts borne by supply regions that host strategic minerals, primarily in the Global South. A critical framework that examines the corporate energy transition's complete material footprint underscores that this process begins in extractive territories, thereby reproducing historical logics of subordination and territorial sacrifice.

Furthermore, in line with the arguments presented in the second section, mineral "criticality" is neither universal nor neutral but a situated geopolitical construction. In South America, many of the minerals classified as critical by the United States or the European Union—such as lithium, copper, and rare earth elements—are not scarce resources but strategic assets whose sovereign management could unlock political, technological, and productive leverage. From a pragmatic standpoint, however, current trends show that these resources are systematically absorbed into global value chains controlled by external actors. This integration deepens existing dependencies and forecloses the possibility of aligning the energy transition with regional development priorities.

The analysis in the third section demonstrated that global competition among China, the United States, and the European Union to secure access to strategic resources reinforces South America's subordinate role in the global energy transition. While China deploys these resources to expand its productive capacity and consolidate industrial leadership, the United States and the European Union view them as vital to safeguarding their energy, mineral, and technological security and strive to reduce reliance on strategically sensitive suppliers. Within this arena, South America functions as a primary battlefield for global mineral procurement, a dynamic that severely erodes its sovereign decision-making capacity over its resource wealth.

Consequently, the corporate energy transition represents a structural mutation in historical accumulation patterns. The global system is shifting from reliance on fossil fuels to a multi-dependency on critical minerals, deepening neo-extractivism and entrenching energy colonialism, or green neocolonialism, across the Global South. This dynamic does not challenge the core logic of indefinite energy consumption or the dominant development model. Instead, it reconfigures capitalism under a new "green" narrative that imposes a mandatory decarbonization model on South America, despite the region's lowest share of global greenhouse gas emissions.

In this context, South America faces a fundamentally political challenge. The manner in which states manage their strategic resources will dictate whether these assets serve as catalysts for a just energy transition or as drivers of structural subordination. Achieving a truly transformative energy transition for South America cannot be restricted to adopting foreign technologies or supplying raw materials to the Global North. It requires a profound overhaul of the domestic development model, energy consumption patterns, and power asymmetries traversing the global value chain. Such a restructuring is essential to prevent the energy transition from reproducing, under novel guises, the same historical inequalities that have long defined the region's insertion into the world economy.

By way of closure, as argued throughout the article, moving toward alternative models requires South America to recover decision-making authority over its own resources, articulate energy sovereignty with social and environmental justice, and recognize that there is no single possible transition, but rather multiple situated transitions, tailored to the territorial realities of each country, to ensure a profound transformation of the energy transition, adapted to its own agenda. ●

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