

From Fossils to Minerals: The Hidden Challenges of the Energy Transition

Mariana Gámez Pineda

School of Politics, Economics and Global Affairs, IE University, Madrid, Spain
Dual Degree in Business Administration and International Relations

E-mail: mgamez.ieu2022@student.ie.edu

Published 27th January 2025

Abstract

This paper explores the growing challenges posed by the renewable energy transition, an energy transition driven by the worsening climate crisis and mounting social pressure for sustainable development. A fundamental element of transforming and replacing greenhouse gas-emitting sources with renewable alternatives is the extraction of critical minerals and metals. These minerals are essential for technologies such as wind, solar, and lithium-ion batteries. The urgency to attain these resources, along with the necessity to diversify the mineral supply chain, has led to heightened opposition to mining practices, which are often associated with social and environmental harm. This opposition has presented significant barriers to the rapid adoption and expansion of green technologies, a notion which poses a threat to the climate-resilient ambitions of policy-makers worldwide. Central to this discussion are Europe and South America, two regions that are at the forefront of the transition but with deep contrasts in attitudes and historical contexts regarding these issues. This paper will discuss this systemic transformation, examining its associated costs, and the conflicting priorities that global leaders must navigate.

Keywords: Renewable Energy, Social Opposition, Extractivist Policies, South America, Europe

I. Introduction

The transition to renewable energy has become a central focus of many politicians worldwide. This emphasis is underpinned by alarming research that highlights the concerning pace of global warming that is threatening societies, ecosystems, and the stability of our planet. A report by the United Nations Intergovernmental Panel on Climate Change (IPCC) (2023), outlines the grim future ahead as a consequence of the rising greenhouse gas

emissions.¹ This scientific assessment on climate change underscores the need to rapidly shift away from the burning of fossil fuels, as well as implement system-wide transformations in order to ensure a climate-resilient future.²

¹ Intergovernmental Panel on Climate Change, "Climate Change 2023 Synthesis Report", 2023.

² Sophie Boehm and Clea Schumer. "10 Big Findings of the 2023 IPCC Report on Climate Change." *World Resources Institute* (2023).

In this context, countries all around the world have begun to substantially increase their capacity to generate renewable energy. The International Energy Agency (2024) highlights that the world's renewable energy capacity grew by 50% in 2023 and that states' sustainable energy potential is expanding at a faster rate than at any point in the past three decades.³ This trend is heightened by increased social pressure for a green transition.

While this is encouraging progress for sustainable development, the transition to renewable energy entails a distinct set of challenges and costs. Fundamentally, the renewable energy transition defined as "the global energy sector's shift from fossil-based systems of energy production and consumption - including oil, natural gas, and coal - to renewable energy sources like wind and solar, as well as lithium-ion batteries,"⁴ increases the demand for critical minerals and metals.⁵ Despite the necessity of a revived mining industry to ensure the continuous supply of these minerals, tensions exist between the environmental and social impacts of the industry and the goals of the green transition. One may observe a trend for intensive exploitation of resources that is framed as compatible with, and essential for climate action.

This paper will discuss and explore the critical dilemma between renewable energy and extractive policies, which is

amplified by the anti-mining sentiment evident in the European Union (EU) and South America. Additionally, instruments employed by states to mitigate this friction will also be addressed.

II. Background

Although technological solutions for transitioning to green energy are less fuel-intensive, they are more material-intensive than non-renewable technologies.⁶ For instance, photovoltaic cells, lithium-ion batteries, and wind turbines depend on large quantities of critical raw materials such as copper, lithium, nickel, and cobalt. Thus, mined resources are fundamental components to power cleaner energy technologies.⁷ In this context, it becomes clear that through an increase in demand for renewable energy, a simultaneous rise in mining activity must follow.

The World Economic Forum recently stated that the market for key energy transition minerals has doubled over the past five years, and the total demand for critical minerals and metals is expected to increase twofold or fourfold by 2040.⁸ Furthermore, other global studies, such as those conducted by Drexhage et al. (2017), Hund et al. (2020), and the IEA (2021), predict that demand for minerals like lithium, graphite, and cobalt will increase by upwards of ten times current production levels. In light of

³ International Energy Agency. "Massive expansion of renewable power opens the door to achieving the global tripling goal set at COP28." January 11, 2024.

⁴ S&P Global. "What is the Energy Transition." 2020.

⁵ Benjamin Gibson et al. "The energy transition will need critical minerals and metals. Here's how to mine responsibly." *World Economic Forum*, 2024.

⁶ Terah U De Jong et al. "Mining and the Green Energy Transition." *USAID*, 2021.

⁷ Isaacs-Thomas, Bella. "Mining is necessary for the green transition: Here's why experts say we need to do better." *PBS News*, 2023.

⁸ Gibson et al. "The energy transition" 2024.

this, it is evident that in the coming years, the mining sector will play a pivotal role in the green transition.⁹

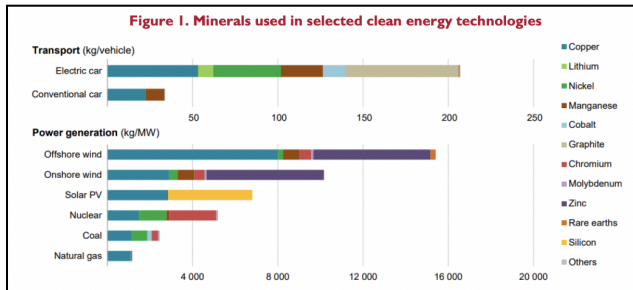


Fig.1: Minerals used in selected clean energy technologies.
Source: International Energy Agency, 2021.

Nevertheless, at this stage, the perils of mining begin to emerge. While extractive industries, particularly in developing countries, have immense potential to drive growth and support sustainable development, their actual contribution has been hindered by social, environmental, and governance concerns.¹⁰ Moreover, the mining industry has been historically tied to widespread contamination and human health hazards. Extraction projects cause serious water and soil pollution, lead to deforestation, and biodiversity loss.¹¹ These factors, among many others, contribute to the rise of an anti-mining sentiment, characterized by strong opposition, negative attitudes, and active resistance towards the mining industry and its activities.

⁹ Isaacs-Thomas. "Mining is necessary" *PBS News*, 2023.

¹⁰ United Nations. "Policy Brief: Transforming extractive industries for sustainable development." 2021.

¹¹ Adator Worlanyo et al. "Evaluating the environmental impact of mining for post-mined land restoration and land-use: A review." *Journal of Environmental Management* (2021).

One can argue that a complete phase-out of fossil fuels may overlook that a shift to renewable energy involves expanding mining infrastructure, which evidently has its environmental challenges.¹² While most experts recognize the necessity to determine a way to mine more responsibly to concurrently meet the demands of the clean energy transition and limit environmental and social harm, most politicians fail to address that their extractive policies are putting vulnerable communities at risk.¹³ For this reason, social opposition towards the extraction of critical minerals worldwide is centered around this inherent contradiction between environmental goals of reducing GHG emissions and the detrimental consequences of mining for sustainable energy initiatives.

What is clear is that anti-mining protests and social movements in an increasing number of countries are jeopardizing the sustained extraction of critical minerals, a happening that many fear will further disrupt an already unstable supply chain and limit the advancements of clean energy.¹⁴ Moreover, policymakers continue to stress the importance of domestic mineral production in order to minimize important dependence while environmentalists express concerns of this expansion.¹⁵

How to balance these priorities was one of the topics discussed by world leaders, policymakers, and researchers at

¹² Elena Gnant, "Opposing 'green' extractivism." *Lund University*, 2022.

¹³ Isaacs-Thomas. "Mining is necessary." 2023.

¹⁴ Greetje Frankena, "Critical minerals in LAC are key for energy transition," *Atradius*, March 5, 2024.

¹⁵ Vitor Correia et al. "Understanding the narratives in the public debate about mining in Europe." *Journal of the European Federation of Geologists* (2024).

the COP28 climate conference in Dubai in 2023. UN Secretary-General, António Guterres, emphasized the importance of augmenting renewables capacity, energy efficiency and clean energy production by 2030. However, he also stressed that this transition should be done in the most “just, fair, and equitable” manner possible in order to minimise the geopolitical risks and environmental and social challenges.¹⁶ Additionally, he argued that the world cannot repeat past mistakes by systematically exploiting developing countries for their raw materials.¹⁷

Given this setting, the following section will dive deeper into the tensions that have emerged in countries within the European Union and South America. What distinguishes these two regions of the world in terms of extractive policies is their mining legacy. European countries have historically been primary importers of critical minerals, relying on developing countries with rich resources for their supply - a notion that began to shift due to a desire to reduce dependency on external entities. On the other hand, South America is a region with vast mineral resource reserves, being a net exporter of the latter.¹⁸ As mentioned above, it is clear that with an increase in renewable energy initiatives, demand for their raw materials will increase, and will further threaten the livelihood of societies and biodiversity alike.

¹⁶ Laura Quiñones, “COP28: Extraction of minerals needed for green energy must be ‘sustainable and just’, says Guterres,” *UN News*, 2023. Quiñones, “COP28”.

¹⁷ Quiñones, “COP28”.

¹⁸ Circle Economy Foundation. “Latin America exports 40% of its extracted resources at the cost of environmental degradation, new study finds.” *Circle Economy*, 2024.

III. Case Studies

As renewable energy initiatives expand globally, the interest in critical minerals and other metals used in green technologies has resulted in a reassessment of extractive policies worldwide. This is driven primarily by the desire to diversify the global resource supply chain, and has led to the granting of concessions and permits to engage in mining activities. However, these policies have not been very popular among the populace.

Prior to discussing the potential consequences of increased mining behaviour, it is essential to outline the supply chain landscape in order to better understand the geopolitical motivations driving these actions. Currently, mineral security has become an essential factor in energy security and industrial policy. Hence, excessive market concentration poses a significant systemic risk for national security and decarbonization.¹⁹ In the present global market, China holds strategic dominance over the world’s critical minerals, metals, and commodities; with the Democratic Republic of Congo and other countries in South America also holding abundant supplies. The formers are the world’s largest refiners, producers, and consumers of metals. Critical materials for renewable technologies are processed almost entirely in China: 60 - 70% of lithium and cobalt, almost 60% of nickel, and 90% or rare earth elements.²⁰ This domination of mineral supply chains is best illustrated by the fact that China is

¹⁹ Rebecca Campbell et al. “Geopolitics and decarbonization in the mining & metals sector.” *White & Case*, 2023.

²⁰ Jamie Smyth and Harry Dempsey. “Western nations join forces to break China’s grip on critical minerals.” *Financial Times*, 2024.

“the largest source of U.S imports for 26 of the 50 minerals that are currently classified as critical by the United States Geological Survey.”²¹ In the context of clean energy technologies, such as wind turbines and solar panels, the three largest producer countries together control at least 70% of manufacturing capacity for each technology, China being dominant in all of them.

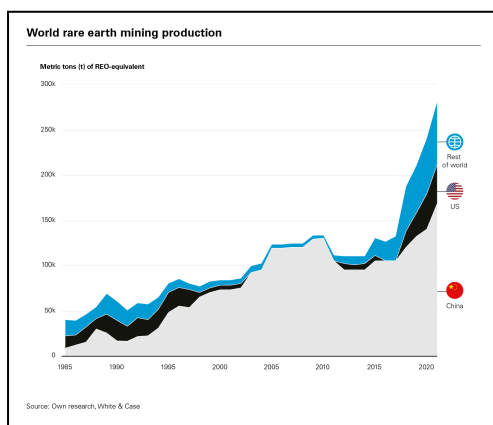


Fig. 2: World rare earth mining production.
Source: White & Case, 2023.

Therefore, it is evident that concentration at any stage in the supply chain exposes the entire chain to risks.²² As a result, mitigation measures and reducing reliance on foreign imports is a key strategy for diversification. In this context, and amid rising tension between the world powers, building resilient critical minerals supply chains is fundamental.²³ However, one might ask: at what cost?

²¹ Majkut et al. “Building larger and more diverse supply chains for energy minerals.” *Center for Strategic and International Studies*, 2023.

²² International Energy Agency. “Energy Technology perspectives 2023.” *IEA*, 2023.

²³ Jasper Wauters and Nikolas Hertel, “Critical Minerals Supply Chain: The Minerals security partnership and trade-related challenges.” *White & Case*, 2024.

3.1 Europe

For decades, the European costs of mining materials, both environmental and human, have not been internalized nor fully considered by EU states. Governments from the Global North have commonly outsourced mining activities, an industry notorious for its environmental harm, human rights violations, and its position as a lesser-valued component of the supply chain (increasing the possibility for protests), thus leaving its impact on the back-burner.²⁴ However, European states have increasingly begun shifting towards the promotion of domestic production, capitalizing upon their rich mineral resources to achieve a more stable and sustainable supply chain.²⁵

The rationale behind this is excessive dependency on foreign countries for raw resources, as eloquently highlighted by Thierry Breton, the EU Commissioner for Internal Market and Services: “When we have such dependencies, and Russia is at war, or China bans exports or there is an earthquake in Chile, we can have a problem.”²⁶ To emphasize the gravity of the situation, it is important to understand that China controls the EU supply of critical raw materials, hence, minimal tensions may jeopardize the EU’s goals of achieving sustainable

²⁴ Thea Riofrancos, “The Security-Sustainability Nexus: Lithium Onshoring in the Global North.” *Global Environmental Politics*, 2023.

²⁵ Sonja Kivinen et al. “Mining conflicts in the European Union: Environmental and political perspectives.” *Fennia: International Journal of Geography*, 2020.

²⁶ Attila Kalman and Amund Trellevik, “Green transition, dirty business: Europe’s struggle to tear loose from Chinese minerals,” *Investigative Europe*, 2023.

development. This is why the EU is exploring ways to diversify its supply away from China to be able to build green technology more efficiently.

The strategy of exploiting domestic reserves aligns with the European Green Deal²⁷ and is underpinned by the Critical Raw Materials Act (CRMA). In May of 2024, the CRMA entered into force following its adoption by the EU Council and the European Parliament.²⁸ The CMA will ensure EU access to a secure and sustainable supply of critical raw materials, when met with a surging global demand for these materials, in order to meet its 2030 climate and digital objectives. More precisely, the CRMA hopes to guarantee a stable supply of nickel, lithium, magnesium, and other materials, as well as provide opportunities for public and private financing for strategic projects (some of which are environmentally harmful but are of overriding public interests, such as...) and streamline permitting procedures.²⁹

This Act is particularly relevant for Europe and its strategic industries such as electrical cars, renewable energy, military equipment, and aerospace systems as it seeks to address the fact that while Europe consumes between

25-30% of the world's metals, spending on mineral exploration stands at a mere figure of 3%.³⁰

In light of this, in 2021, the European Commission's Vice President Maroš Šefčovič outlined: "We need to work together to overcome the important challenge of social acceptance by demonstrating that we will not repeat the mistakes of the past. This means engaging with local communities openly and transparently, and addressing their concerns about potential environmental damage, while highlighting the benefits of raw materials activities for combating climate change and preserving biodiversity."³¹

Therefore, the prevailing narrative in Europe is now one of a trade-off between the security of supply and environmental harm. While policymakers are stressing the importance of increasing domestic mineral production, environmentalists and local communities affected by mining activities express concerns over its ecological harms.³² The country that will be discussed in relation to extractive policies and surging anti-mining sentiments is Portugal. This case exemplifies the tension between the need for sustainable energy and the increasing potential for the disruption of the supply chain needed for the development of the former. Moreover, they also inform on the recent growing phenomenon of 'sacrifice zones', places

²⁷Christin Stuehlen and Felix Anderl. "Transnational companies in environmental conflicts: Rio Tinto, anti-mining resistance in Serbia, and the contradictions of Europeanization." *Z Friedens und Konfliktforschung*, May 2024.

²⁸Baker McKenzie. "Europe: the EU's Critical Raw Materials Act enters into force." 2024.

²⁹ The European Commission. "Critical Raw Materials Act." *European Commission*.

³⁰Manuel Rico, "Mining minerals is not a European business." *Investigative Europe*, 2023.

³¹Dominique Van Meer and Christos Zografos. "Take Your Responsibility: The politics of green sacrifice for just low-carbon transitions in rural Portugal." *Sustainability Science*, 2024.

³²Correia et al. "Understanding the narratives."

whose ecology has been gravely deteriorated for the greater good or a higher social purpose.³³

3.1.1 Portugal & Lithium Extraction

Lithium mining projects in rural Northern Portugal have seen an increase in occurrence. At the epicenter of lithium exploitation, an activity highly endorsed by the national government since the mid-2010s, is the Barroso region - a region particularly rich in deposits and minerals, but also known for its agricultural practices and heritage. In the past five years, 39% of Barroso's land has been slated for mining prospecting or licensing. One of the most significant projects in the area is the proposed 'Mina do Barroso'.³⁴ In 2017, Savannah Resources, a British multi-commodity mineral resource development company was granted a mining lease for lithium mining exploration in Covas do Barroso.³⁵ Since then, the company has been developing plans for an open-pit lithium mine in the area, with the potential for it to become the largest in Western Europe.

From its onset, the mining plan has been highly controversial. While Savannah has promised to invest in technology to achieve the best quality standards and environmental performance, mining, in reality, is not 'green'. Open-pit mining is ecologically destructive and has severe socio-environmental consequences. Particularly in Barroso, $\frac{3}{4}$ of the mine depends on deposits found on

common land owned by the village ('Baldios'), which are currently being used for forestry and pasture.³⁶ The majority of residents in Covas do Barroso, joined to create Unidos em Defesa de Covas do Barroso to oppose the exploration, citing pollution risks and threats to their rights to the landscape. Similarly, climate activists and environmental organizations have also severely criticized the project, through demonstrations, assemblies, and legal action against its implementation. They have continuously rejected financial offers and leases, emphasising the concessions are not enough - they do not want a lithium mine in their town.

The controversy surrounding this mine was exacerbated by its link to the corruption scandal that led to the resignation of Prime Minister António Costa in November 2023 due to the mishandling of exploration concessions.³⁷ Support for anti-mining demonstrations surged due to these accusations, exposing public discontent and urging the government to halt and reassess lithium projects.³⁸

In this context, pro-mining stakeholders have taken diverse approaches to manage this crisis. Savannah Resources has continuously emphasized the economic advantages of the mine, particularly through the creation

³³ Van Meer and Zagafos. "Take Your Responsibility."

³⁴ Alexander Dunlap and Mariana Riquito, "Social warfare for lithium extraction? Open-pit lithium mining, counterinsurgency tactics and enforcing green extractivism in northern Portugal." *Energy Research & Social Science*, 2023.

³⁵ Van Meer and Zagafos. "Take Your Responsibility."

³⁶ Caroline Bayley. "Portugal's Barroso lithium mine project faces villagers' ire." *BBC*, 2023.

³⁷ Dario Antonelli and Giacomo Sini. "Covas do Barroso: Local Resistance to Europe's Lithium Race." *Green European Journal*, 2024.

³⁸ Fernando Mares. "Global opposition to mining impacts green minerals extraction." *Mexico Business News*, 2023.

of jobs and the contribution to the nation's GDP.³⁹ The Portuguese government also highlighted the advantages towards the green transition.⁴⁰ Moreover, according to Dunlap and Riquito (2023), Savannah used social warfare tactics to “infiltrate social bonds, exploit psycho-social vulnerabilities, and attempt to disable anti-mining organizing and unity within the region.”⁴¹

However, one can argue that these entities framed their efforts wrong in order to encourage the populace to re-examine their priorities. The project from its onset has been characterized by the lack of clear processes, transparency, and stakeholder consultation. This only exacerbated the prevalent anti-mining sentiments of the residents and exposed a schism between economic performance and the interest of the people. Residents were not thoroughly informed on the preliminary prospecting and surveying efforts on lithium resources, leading to the underestimation of the scale of the project. Interests were also highly camouflaged.⁴² Moreover, entities suggested a rhetoric that emphasized the feasibility of mining and circularity without stakeholder engagement.

The anti-mining sentiment in Covas do Barroso has delayed the mining production until 2027 due to legal and administrative processes. It is evident that a bottom-down approach to critical mineral exploitation is impeding

progress from taking place, and is acting as a political hurdle to the implementation of renewable energy.

3.2 South America

Due to South America's vast resource pool and mining legacy, the study of mining projects and related resistance movements is centered on this region, with a large focus on extractivism. Latin America is a major producer of critical metals and minerals that are essential for the clean energy transition. It is also one of the most biodiverse regions globally, as outlined by the United Nations Environment Programme, roughly 60% of the world's terrestrial life, and diverse freshwater and marine species are found in the region.⁴³ Hence, with an increased demand for renewable energy, the region has significant potential to expand its role, and gain a predominant position in the market, but also faces significant trade-offs if they were to do so.

Latin America holds some of the world's largest mineral reserves: it accounts for 40% of global production of copper, with Chile at the forefront; supplies 35% of the world's lithium; and has significant amounts of graphite, nickel and manganese, largely focused in Brazil.⁴⁴ Despite their resource endowments, the region has not attracted sufficient investment to increase its exploration capacity in line with its potential.⁴⁵

³⁹ Francisco Carballo-Cruz and Joao Cerejeira. “The Mina do Barroso Project Economic and Development Impacts.” *Universidade do Minho*, 2020.

⁴⁰ Luis Silva and Siddharth Sareen. “The calm before the storm? The making of a lithium frontier in transitioning Portugal.” *The Extractive Industries and Society*, 2023.

⁴¹ Dunlap and Riquito. “Social warfare for lithium extraction?”

⁴² Dunlap and Riquito. “Social warfare for lithium extraction?”

⁴³ Luis A Ramirez Garcia. “How biodiversity conservation can unlock opportunities for Latin America and the Caribbean.” *World Economic Forum*, 2023.

⁴⁴ Alejandra Bernal et al. “Latin America's opportunity in critical minerals for the clean energy transition.” *International Energy Agency*, 2023.

⁴⁵ Bernal et al. “Latin America's opportunity in critical minerals.”

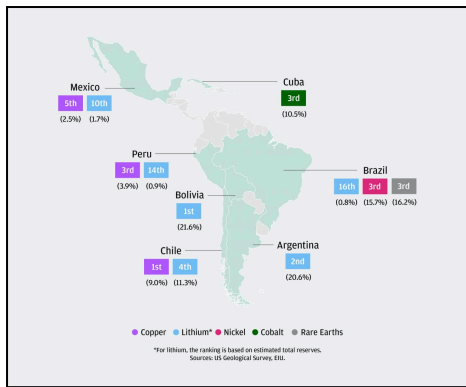


Fig. 3: Latin America's global critical mineral reserves ranking.

Source: *The Economist Impact*, 2022.

Many entities believe that Latin America's well-established mining sector should diversify into new materials, leveraging its position to help the global economy avoid potential supply disruptions that could hinder the effective progress towards the clean energy transition.⁴⁶ However, the mining landscape and the associated sentiments towards it are relatively unfavorable.

Mining projects in this region of the world are prone to significant opposition from local communities. The last decade has seen severe environmental disasters that have fueled anti-mining sentiments in the continent. These include the 2014 spill of 40,000 cubic meters of sulfuric acid in the Sonora River in Mexico,⁴⁷ as well as the tailings dam disaster in Brumadinho, Brazil in 2019 which led to the deaths of hundreds of individuals. Furthermore, 45% of mining conflicts are reported in Latin America due to the

mining industry being centered on sensitive ecosystems exploiting large amounts of land and water.⁴⁸

Additionally, due largely to Latin America's foreign exploitative past, one can see an increasing trend in resource nationalism.⁴⁹ This is a movement where governments begin exerting greater control over their natural resources, influenced by a desire to keep possession of a larger share of economic benefits and ensure direct population benefit. This is best illustrated through increased state role in the mining industry, or even its nationalization.⁵⁰ This policy change takes its roots in policy choices elsewhere. Governments regionally are responding to an increased demand for green transition minerals by leading economies.⁵¹ As suggested by researchers at the Center for Strategic and International Studies (CSIS) (2023), "outsiders should avoid giving the impression that the rules governing the exploitation of transition minerals are, in the first instance, theirs to set. Latin American leaders have legitimate objectives of their own for tomorrow's green economy."⁵² For instance, Mexico's former president López Obrador has been prominently hostile to the mining industry, refusing to grant new mining concessions and introducing administrative obstacles and delays.

⁴⁶ Bernal et al. "Latin America's opportunity in critical minerals."

⁴⁹ BMI. "Resource Nationalism in Latin America: Three Themes to Watch." 2023.

⁵⁰ Shawn Doyle and Josh Friedman. "2023 Political Risk in Latin America: A Primer for Canadian Miners." *McCarthy Tetrault*, 2023.

⁵¹ Lauri Tähtinen and Henry Ziemer. "A Specter Haunting Latin American Mining? Not So Fast." *Center for Strategic and International Studies*, 2023.

⁵² Tähtinen and Ziemer, "A Specter".

⁴⁶ Bernal et al. "Latin America's opportunity in critical minerals".

⁴⁷ Daniel Shailer, "9 years after mine spill in northern Mexico, new report gives locals hope for long-awaited cleanup." *AP News*, 2023.

There are a few factors that stand out in the case of South America. As opposed to Europe, weak regulatory frameworks exist which make potential disasters more likely and more severe. Moreover, what is unique for South America is the government's and citizen's legibility in terms of understanding the region's exploitative past. This, in turn, leads to more effective resistance movements, with a more active and strict civil society towards the conservation of biodiversity and socio-economic consequences.

In Latin America, there exists widespread community frustration with mining companies, associated with worker safety, human rights abuses, and poor environmental performance.⁵³ This is in addition to the lack of trust in the government to successfully enforce environmental and social legal frameworks.⁵⁴ Hence, their previous negative experiences with extractive industries have prompted local disillusionment and caution about its benefits. This is best illustrated by the fact that there are currently 231 communities in conflict with 176 proposed mining projects, according to the Observatory of Mining Conflicts in Latin America.⁵⁵ Moreover, in the 2020s, US\$25 billion of investment in the mining sector was hindered or halted due to conflicts and disputes with civil society.⁵⁶

3.2.1 Peru & Copper Mining

⁵³ Alejandra Martín, "Mining in Latin America: National Policies, Local Opinion." *BSR*, 2023.

⁵⁴ Martín, "Mining in Latin America".

⁵⁵ Martín, "Mining in Latin America".

⁵⁶ Anabel Marin, "Bringing Democracy to Governance of mining for a Just Energy Transition." *Institute of Development Studies*, 2023.

An example of the vehement opposition to mining by local communities is the Tía María mine in the Arequipa Region in the south of Peru. Since 2009, Southern Copper, the world's largest publicly traded mining company, has faced ardent resistance and opposition to their copper mine.⁵⁷ The deposit contains total reserves of close to 711 million tonnes of ore, and the project is expected to eventually produce upwards of 120,000 tons of copper annually.⁵⁸

The Southern Copper mining project, however, has been held up for over a decade due to opposition over the mine's environmental impact. The \$1.4 billion project was deemed unviable due to conflict environmental concerns primarily centered on water contamination.⁵⁹ Furthermore, there were also grave concerns of the insufficient consultation with "affected districts in line with the Indigenous and Tribal Convention 169 (ILO 169) - and especially their right to free, prior, and informed consent."⁶⁰

The population of Valle del Tambo emphasise that they do not need another source of economic activity in their region, highlighting that their agricultural capacity is more

⁵⁷ Alexander Dunlap, "Agro sí, mina no! The Tia Maria copper mine, state terrorism and social war by every means in the Tambo Valley, Peru." *Political Geography*, 2019.

⁵⁸ Southern Cooper. "Proyecto Tía María - SCC." *Southern Copper Corporation*, 2024.

⁵⁹ Hector Morales Muñoz et al. "Climate security and critical minerals mining in Latin America: How can business help?" *Climate Diplomacy*, 2023.

⁶⁰ Hector Morales Muñoz et al. "Climate security and critical minerals mining in Latin America. "

than sufficient.⁶¹ The land in the area is used to produce rice, garlic, potatoes, onions, and sweet potatoes, among others. They fear that copper mining will pollute the Tambo River and other diverse water bodies and make agriculture impossible. Jaime Borda, executive secretary of Red Muqui, a network of activist groups supporting communities affected by mining, also emphasizes that the agricultural industry has no risk of contamination, as opposed to the former.⁶² Moreover, apart from losing the traditional economic activity, the mine could negatively affect water reserves and endanger people's health. Copper mines pose a risk of leaching chemicals like sulfuric acid into the groundwater.⁶³

Therefore, we can observe the grave situation that the local community faces if the mine were to continue. There are several key milestones that are important to mention in relation to this conflict. Firstly, in September 2009, over 96% of the residents in the district of Dean Valdivia, Cochacra, and Punta de Bombon voted against the mine.⁶⁴ In 2011, the whole project was suspended after an independent review was conducted by a U.N agency which deemed that Southern Copper had to address 138 environmental and social concerns.⁶⁵ In 2015, officials reinstated the project, leading to an indefinite resident

strike that led to several deaths and hundreds of individuals injured after clashes with law enforcement. In 2019, after several new protests emerged, the government suspended Southern Copper's construction license for 4 months and informed the company that it could only move forward with the project when social conditions improved.⁶⁶ Furthermore, as vice president, Boluarte promised a definite closure of the mine - however, this has not happened.

Overall, the political reactions from Southern Copper and the Peruvian government have been diverse. The local community organized popular consultations, demonstrations, and strikes, many of which were met with violent repression.⁶⁷ The social resistance to this mine has been very intense and while the government began tolerating and reacting positively at first, priorities in recent years have shifted.

Despite these efforts, and much to the dismay of local communities, Southern Cooper has recently stated that they will initiate construction of Tia Maria in 2025. They have outlined that they have no pending licenses, have all the authorizations needed, and have continuously worked with the community to improve the social conditions.⁶⁸ Moreover, in their statement, they emphasized the creation of jobs as an advantage to the mine's presence, the installation of fog collectors, and the implementation of

⁶¹ Business & Human Rights Resource Center. "Peru: Tia Maria copper mine could begin operations before the end of the year despite concerns from local communities." 2024.

⁶² Maxwell Radwin, "Tia Maria copper mine set to open in Peru despite community backlash." *Mongabay*, 2024.

⁶³ Radwin. "Tia Maria copper mine."

⁶⁴ Radwin. "Tia Maria copper mine."

⁶⁵ Julian Turner, "Tia Maria: Peru's commodity versus community dilemma." *Mining Technology*, 2019.

⁶⁶ Radwin. "Tia Maria copper mine."

⁶⁷ Dunlap, "Agro sí, mina no!"

⁶⁸ AX Legal. "Peru Project Pipeline - Tia Maria Copper Project." 2024.

earth moving works this year.⁶⁹ Furthermore, large mining projects have an important role in improving the Peruvian economy, and hence since assuming presidency in 2022, Boluarte has looked to increase mining investment and infrastructure as a way forward, particularly in light of the severe economic and political crisis Peru is facing. Hence, what is clear in this case is that economic priorities largely overshadow environmental concerns despite initial ailment.

In order for mining projects to be more positively viewed and reconcile with inclusive growth, Anabel Marin, Research Fellow at the Institute of Development Studies (2023), emphasized the need for the entire governance frameworks of natural resources to be re-designed, “bringing a proactive and democratic approach to a vital economic area.”⁷⁰ She outlines the importance of involving local communities at early stages to co-produce policies for mining projects. This is in contrast to the current reality, where public consultations prior to project development are only a minor practice in Latin America.⁷¹

IV. The Path Forward & Key Takeaways

As perceived through the case studies presented - perspectives on the Global South and the Global North - states worldwide are facing a dual pressure: there is an increased need for extraction but there are socio-economic

and environmental consequences that accompany it. Reconciling these two pressures is a complicated yet decisive task. In Peru specifically, much of the grievances towards the mining industry stem from lower-income populations and indigenous communities, as they were gravely affected by past industry and government practices. As suggested by Bebbington (2009), resource extraction in South America has had many adverse effects: “at an aggregate level, it has been associated with a relative concentration of benefits (*“no hay chorreo,”* or “there is no trickle down,” as is said in Peru) and with a failure to develop institutions to ensure transparent governance of the natural resource economy and the rents it generates.”⁷² Moreover, historically in Europe, there has been very little emphasis on mining, and hence this renewed need for extractive policies has somewhat caught the population by surprise, particularly a population with a green attitude towards the exploitation of the earth.

Firstly, it is important to mention the disconnection between top-down directives and bottom-up concerns. Policies developed are prioritizing sustainable economic growth and the associated resource acquisition, and are often overlooking and inadequately addressing the local impacts of the extraction activities.⁷³ In this regard, stakeholder engagement is essential. Many critical think tanks emphasize the exclusion of participation in planning and ownership. Opponents to lithium mining are often

⁶⁹ Forbes Staff. “Southern Copper estima que iniciará la construcción de Tia Maria en 2025.” *Forbes*, 2024.

⁷⁰ Sophie Robinson, “Scale of conflict between mineral mines and indigenous peoples revealed.” *Institute of Development Studies*, 2023.

⁷¹ Tulsa Oré Monago, “Critical Minerals in Latin America.” *Baker Institute of Public Policy*, 2024.

⁷² Anthony Bebbington, “Contesting Environmental Transformation.” *Latin America Research Review*, 2009.

⁷³ Hajo Eicken et al. “Connecting Top-Down and Bottom-Up Approaches in Environmental Observing.” *BioScience*, 2021.

disregarded and restricted in participation in decision-making processes.⁷⁴

In Europe for example, the discourse on the responsibility of public institutions is centred around convincing instead of considering the opposition. European institutions are focused on employing effective strategies to convince communities on the benefits of mining. As suggested by Van Meer and Zografos (2024), institutions emphasize the need to reform public opinion in order for mines to be accepted without paying attention to health and environmental consequences in the process towards it.⁷⁵ This discourse of responsibility adopted by both the government and corporate action, assigns “public institutions the role of convincing communities to accept ‘green’ mining; to corporations the role of exercising corporate social responsibility; and to affected populations the role of subjects whose political action should conform to their consumption habits and help deliver a distinctive ‘European way’ of being responsible in a warming world.”⁷⁶

⁷⁶ For instance, Savannah Resources developed two community plans to highlight their commitment to becoming a valued member of the local community and endorse CSR.

Beyond Europe, the main discursive strategies to legitimize mining is the association of green technologies with employment and socio-economic progress, and

climate-friendly extraction.⁷⁷ For instance, in 2016, the Government of Chile highlighted their confidence “that Chile’s lithium will not be a case of frustrated development but an example of a well-built future.”⁷⁸

Another factor that is quintessential to this dilemma is the need for transparency with these projects. Informing local communities, allowing them to object and suggest, and involving them in the decision-making processes is essential to avoid repeating the mistakes of the past. Transparency over water waste and pollution and emissions is essential. Prior to initiating new mining projects, baselines for key environmental indicators should be established and monitored constantly. Risk and tailings management - the waste materials left after the target mineral is extracted from ore - and response preparedness should also be a priority, along with the transmission of reliable public information.⁷⁹ This is very applicable in the context of environmental regulation. Numerous mining projects cite their compliance with the Environmental Impact Assessment (EIA) as a judge of the feasibility and sustainability of the former. However, grave concerns exist with this procedure. In the EU particularly, there were many petitions with inadequate, incomplete, or a lack of

⁷⁴ European Environmental Bureau. “Top 10 Problems for Renewable Energy in Europe. *EEB*, 2022.

⁷⁵ Van Meer and Zografos. “Take Your Responsibility.”

⁷⁶ Van Meer and Zografos. “Take Your Responsibility.”

⁷⁷ Daniel M. Voskoboynik and Diego Andreucci. “Greening extractivism: Environmental discourses and resource governance in the ‘Lithium Triangle.’” *Environment and Planning E: Nature and Space*, 2021.

⁷⁸ Michelle Bachalet, “‘El litio chileno no será un caso de desarrollo frustrado, sino un ejemplo de futuro bien.’” *Gobierno de Chile*, 2016.

⁷⁹ Sofia Economopoulos. “Global race for critical minerals... a unique opportunity for Latin America.” *Economist Impact*, 2024.

EIAs.⁸⁰ With proper EIAs, mining operations proceed with little regard to the potential detrimental effects to the environment. This may lead to degradation of ecosystems and the contamination of water sources, among others. This is fully contradictory to the set vision the EU wants to achieve with its green transition. If damage were to happen, biodiversity offsetting (compensation of biodiversity loss) should be mandatory in legislation, outlines a report by the EU's PETI Committee.⁸¹

Central to this argument is the question of how states should approach the green transition. The energy transition model, now focused on extractivism, prioritizes mineral extraction, but the mining industry is extremely harmful to local communities and biodiversity. It is hence important to critically evaluate how much extractive projects tackle the root causes of climate change. Potentially, it is not as simple as replacing one industry with another, but changing whole consumption mindsets and economies.

Moreover, resistance to the mining industry is not only about the location of the mines, as suggested by Van Meer.⁸² The challenge is also framed around the positive outlook given by governments on the logic of a circular economy that is compatible with extensive mining projects. However, without social acceptance, this rhetoric will never have the support needed.

⁸⁰ European Parliament: Department for Citizen's Rights and Constitutional Affairs. "Social and environmental impacts of mining activities in the EU." *European Parliament*, 2022.

⁸¹ European Parliament, "Social and environmental impacts of mining activities."

⁸² Van Meer and Zografos, "Take Your Responsibility."

Lastly, it is important to recognize that while this extraction strategy aligns with decarbonization goals, it contributes very meaningful to the emergence of new environmental conflicts. In this context, although the pressure to increase production is extremely high, policymakers should not be blinded by this pressure in order to ignore all correct practices. For instance, direct financing and speedy environmental permitting without the proper frameworks may exacerbate local communities' discontent with the situation and aggravate the supply chain insecurity further.

V. Conclusion

The need for the adoption of renewable energy initiatives is clearer now than ever before, particularly in light of surmounting global temperatures and increasing GHG emissions worldwide. However, the implementation of these technologies requires a rise in the extraction of critical raw materials, obtained through mining. Entities globally are increasing the pressure from states to implement extractive policies to address the soaring demand for these essential resources. However, a fundamental factor that is impeding the fast development of technologies is an anti-mining sentiment driven by detrimental socio-environmental impacts that extractive policies have on the populace and on biodiversity. Hence, what we are observing in regions like Europe and South America is the hindering of the effective development of mining projects, an increase in regulatory costs, as well as limited access to critical minerals. These shortages are affecting the feasibility and pace at which renewable

technologies may be deployed as balancing mineral sourcing with environmental concerns remains a deep concern for policymakers and citizens.

We cannot identify a single solution to this increased tension between extractive policies and an anti-mining sentiment. Yet, as a senior reporter for Coda, Isobel Cockerell powerfully suggests (2023), confronting the deeper issue at stake - climate mitigation - is not as straightforward as “trading out one extractive industry for another.”⁸³ For durable and effective change to take place, we must challenge the systems that got us here in the first place.

While attitudes towards environmental policies are positive, the cost of these policies is primordial. No matter what the energy transition entails, these costs are a definitive fact. In this context, governments, institutions, and corporations must ensure the protection of the socio-economic environment: legally through more restrictive and coordinated policies, increase in stakeholder engagement, and understanding the core grievances of communities. And so, assuming these costs are going to take place regardless might be the first step, and disregarding the opposition will only increase future backlash towards extraction.

⁸³ Isobel Cockerell, “In the Swedish Arctic, a battle for the climate rages.” *Coda Story*, 2023.

V. List of Figures

Figure 1: Minerals used in selected clean energy technologies. 3

Figure 2: World rare earth mining production..... 5

Figure 3: Latin America’s global critical mineral reserves ranking 9

VI. References

- Antonelli, Dario, and Giacomo Sini. “Covas do Barroso: Local Resistance to Europe’s Lithium Race.” *Green European Journal*, February 27, 2024. <https://www.greeneuropeanjournal.eu/covas-do-barroso-local-resistance-to-europes-lithium-race/>.
- AX Legal. “Peru Project Pipeline - Tia Maria Copper Project - AX | LEGAL.” *AX Legal*, May 24, 2024. <https://ax.legal/2024/05/28/peru-project-pipeline-tia-maria-copper-project/>.
- Bachelet, Michelle. “Presidenta Bachelet: “El litio chileno no será un caso de desarrollo frustrado, sino un ejemplo de futuro bien construido.”” *Gobierno de Chile*, 2016. www.gob.cl/noticias/presidenta-bachelet-el-litio-chileno-no-sera-un-caso-de-desarrollo-frustrado-sino-un-ejemplo-de-futuro-bien-construido/.
- Baker Mckenzie. “Europe: The EU's Critical Raw Materials Act enters into force.” *Baker Mckenzie*, May 27, 2024. <https://insightplus.bakermckenzie.com/bm/projects/europe-the-eus-critical-raw-materials-act-enters-into-force>.
- Bayley, Caroline. “Portugal’s Barroso lithium mine project faces villagers’ ire.” *BBC*, October 19, 2023. <https://www.bbc.com/news/world-europe-67135047>.
- Bebbington, Anthony. “Contesting Environmental Transformation.” *Latin America Research Review* 44, no. 3 (2009): 177-186. <https://dx.doi.org/10.1353/lar.0.0119>.
- Bernal, Alejandra, Joerg Husar, and Johan Bracht. “Latin America’s opportunity in critical minerals for the clean energy transition.” *International Energy Agency*, April 7, 2023. <https://www.iea.org/commentaries/latin-america-s-opportunity-in-critical-minerals-for-the-clean-energy-transition>.
- BMI. “Resource Nationalism In Latin America: Three Themes To Watch.” *BMI*, August 10, 2023. <https://www.fitchsolutions.com/bmi/mining/resource-nationalism-latin-america-three-themes-watch-10-08-2023>.
- Boehm, Sophie, and Clea Schumer. *10 Big Findings from the 2023 IPCC Report on Climate Change*. World Resources Institute. 2023. <https://www.wri.org/insights/2023-ipcc-ar6-synthesis-report-climate-change-findings>.

- Business & Human Rights Resource Center. “Peru: Tía María copper mine could begin operations before the end of the year despite concerns from local communities.” *Business & Human Rights Resource Center*, August 3, 2024.
<https://www.business-humanrights.org/en/latest-news/peru-tia-maria-copper-mine-could-begin-operations-before-the-end-of-the-year-despite-concerns-from-local-communities/>.
- Campbell, Rebecca, John Tivey, Kamran Ahmad, and David E. Bond. “Geopolitics and decarbonization in the mining & metals sector.” *White & Case*, September 18, 2023.
<https://www.whitecase.com/insight-our-thinking/geopolitics-and-decarbonization-mining-metals-sector>.
- Carballo-Cruz, Francisco and Joao Cerejeira. “The Mina do Barroso Project Economic and Development Impacts.” *Universidade do Minho*, July 2022.
https://www.savannahresources.com/media/uuri54jx/the-mina-do-barroso-project-economic-development-impacts_universityofminho_english_final.pdf
- Circle Economy Foundation. “Latin America exports 40% of its extracted resources at the cost of environmental degradation, new study finds.” *Circle Economy*, February 9, 2024.
www.circle-economy.com/news/latin-america-exports-40-of-its-extracted-resources-at-the-cost-of-environmental-degradation-new-study-finds.
- Cockerell, Isobel. “In the Swedish Arctic, a battle for the climate rages.” *Coda Story*, December 7, 2023.
<https://www.codastory.com/climate-crisis/sweden-climate-change-colonialism/>.
- Correia, Vitor, Luis Rosendo, and Eberhard Falck. “Understanding the narratives in the public debate about mining in Europe.” *Journal of the European Federation of Geologists* 57 (2024). ISSN: 1038-267X.
- De Jong, Terah U., Titus Sauerwein, and Ludivine Wouters. “Mining and the Green Energy Transition.” *LandLinks | USAID*, November 2021.
https://www.land-links.org/wp-content/uploads/2021/11/Green-Energy-Minerals-Report_FINAL.pdf.
- Doyle, Shawn, and Josh Friedman. 2023. “2023 Political Risk in Latin America: A Primer for Canadian Miners.” *Mccarthy Tetraault*, March 6, 2023.
<https://www.mccarthy.ca/en/insights/blogs/mining-praspects/2023-political-risk-latin-america-primer-canadian-miners>.
- Dunlap, Alexander. “‘Agro sí, mina NO!’ The Tía María copper mine, state terrorism and social war by every means in the Tambo Valley, Peru.” *Political Geography* 71 (2019): 10-25.
<https://doi.org/10.1016/j.polgeo.2019.02.001>.
- Dunlap, Alexander, and Mariana Riquito. “Social warfare for lithium extraction? Open-pit lithium mining, counterinsurgency tactics and enforcing green extractivism in northern Portugal.” *Energy Research &*

- Social Science* 95 (2023).
<https://doi.org/10.1016/j.erss.2022.102912>.
- Economopoulos, Sofia. “Global race for critical minerals... a unique opportunity for Latin America?” *The Economist Impact*, June 24, 2024.
https://impact.economist.com/perspectives/sustainability/global-race-critical-minerals-unique-opportunity-latin-america#_ftn2.
- Eicken, Hajo, Finn Danielsen, Josephine-Mary Sam, Maryann Fidel, Noor Johnson, Michael K. Poulsen, Olivia A. Lee, Katie V. Spellman, Lisbeth Iversen, Peter Pulsifer, and Martin Enghoff. “Connecting Top-Down and Bottom-Up Approaches in Environmental Observing.” *BioScience* 71, no. 5 (2021): 467- 483.
<https://doi.org/10.1093/biosci/biab018>
- The European Commission. “Critical Raw Materials Act.” European Commission.
https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/critical-raw-materials-act_en.
- European Environmental Bureau. “Top 10 Problems for Renewable Energy in Europe.” *EEB*, 2022.
<https://eeb.org/wp-content/uploads/2022/05/Top-10-problems-for-renewable-energy-in-Europe.pdf>.
- European Parliament: Policy Department for Citizens’ Rights and Constitutional Affairs. “Social and environmental impacts of mining activities in the EU.” *European Parliament*, May 2022.
- [https://www.europarl.europa.eu/RegData/etudes/STUD/2022/729156/IPOL_STU\(2022\)729156_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2022/729156/IPOL_STU(2022)729156_EN.pdf).
- Forbes Staff. “Southern Copper estima que iniciará la construcción de Tía María en 2025.” *Forbes*, July 19, 2024.
<https://forbes.pe/negocios/2024-07-19/southern-copper-estima-que-iniciara-la-construccion-de-tia-maria-en-2025>.
- Frankena, Greetje, and Dana Bodnar. “Critical minerals in LAC are key for energy transition.” *Atradius*, March 5, 2024.
<https://group.atradius.com/knowledge-and-research/reports/critical-minerals-in-lac-are-key-for-energy-transition>.
- Gibson, Benjamin, Joel Frijhoff, and Kadie Fedosenko. “The energy transition will need critical minerals and metals. Here’s how to mine responsibly.” *World Economic Forum*, June 20, 2024.
<https://www.weforum.org/stories/2024/06/energy-transition-critical-minerals-mining>.
- Gnant, Elena. “Opposing ‘green’ extractivism: Voices of resistance in the case of the Gállok iron mine, Sápmi.” *Lund University*, 2022.
<https://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=9097252&fileOId=9097253>
- Intergovernmental Panel on Climate Change. *Climate Change 2023 Synthesis Report*. Geneva, Switzerland: IPCC, 2023. 10.59327/IPCC/AR6-9789291691647.

- International Energy Agency. "Energy Technology Perspectives 2023." *IEA*, 2023.
<https://iea.blob.core.windows.net/assets/a86b480e-2b03-4e25-bae1-da1395e0b620/EnergyTechnologyPerspectives2023.pdf>.
- International Energy Agency (IEA). "Massive expansion of renewable power opens door to achieving global tripling goal set at COP28 - News - IEA." *International Energy Agency*, January 11, 2024.
<http://www.iea.org/news/massive-expansion-of-renewable-power-opens-door-to-achieving-global-tripling-goal-set-at-cop28>.
- Isaacs-Thomas, Bella. "Mining is necessary for the green transition. Here's why experts say we need to do it better." *PBS News*, December 8, 2023.
www.pbs.org/newshour/science/mining-is-necessary-for-the-green-transition-heres-why-experts-say-we-need-to-do-it-better.
- Kalman, Attila, and Amund Trellevik. "Green transition, dirty business: Europe's struggle to tear loose from Chinese minerals." *Investigate Europe*, October 26, 2023.
<https://www.investigate-europe.eu/posts/green-transition-mines-metals-minerals-china-europe>.
- Kivinen, Sonja, Juha Kotilainen, and Timo Kumpula. "Mining conflicts in the European Union: environmental and political perspectives." *Fennia - International Journal of Geography* 198, no. 1-2 (2020). 10.11143/fennia.87223.
- Majkut, Joseph, Jane Nakano, Maria J. Krol-Sinclair, Thomas Hale, and Sophie Coste. "Building Larger and More Diverse Supply Chains for Energy Minerals." *Center for Strategic & International Studies*, July 19, 2023.
<https://www.csis.org/analysis/building-larger-and-more-diverse-supply-chains-energy-minerals>.
- Mares, Fernando. "Global Opposition to Mining Impacts Green Minerals Extraction." *Mexico Business News*, November 16, 2023.
<https://mexicobusiness.news/mining/news/global-opposition-mining-impacts-green-minerals-extraction>.
- Marin, Anabel. "Bringing Democracy to Governance of Mining for a Just Energy Transition." *Institute of Development Studies*, August 2023.
https://opendocs.ids.ac.uk/articles/report/Bringing_Democracy_to_Governance_of_Mining_for_a_Just_Energy_Transition/26429260?file=48182347.
- Martin, Alejandra. "Mining in Latin America: National Policies, Local Opinion." *BSR*, March 11, 2013.
<https://www.bsr.org/en/blog/mining-in-latin-america-national-policies-local-opinion>.
- Morales Muñoz, Hector C., Johanna Dieffenbacher, Raquel Munayer, and Beatrice Mosello. "Climate security and critical minerals mining in Latin America: How can business help?" *Climate Diplomacy*, March 17, 2023.
<https://climate-diplomacy.org/magazine/environment>

- [/climate-security-and-critical-minerals-mining-latin-america-how-can-business.](#)
- Oré Mónago, Tilsa. “Critical Minerals in Latin America.” *Baker Institute of Public Policy*, August 22, 2024. <https://www.bakerinstitute.org/research/critical-minerals-latin-america>.
- Quiñones, Laura. “COP28: Extraction of minerals needed for green energy must be ‘sustainable and just’, says Guterres.” *UN News*, December 2, 2023. <https://news.un.org/en/story/2023/12/1144267>.
- Radwin, Maxwell. “Tía María copper mine set to open in Peru despite community backlash.” *Mongabay*, July 31, 2024. <https://news.mongabay.com/2024/07/tia-maria-copper-mine-set-to-open-in-peru-despite-community-backlash/>.
- Ramirez Garcia, Luis A. “How biodiversity conservation can unlock opportunities for Latin America and the Caribbean.” *World Economic Forum*, June 30, 2023. <https://www.weforum.org/stories/2023/06/biodiversity-conservation-latin-america-caribbean/>.
- Rico, Manuel. “Mining for minerals is not a European business.” *Investigative Europe*, October 26, 2023. <https://www.investigate-europe.eu/posts/mining-minerals-not-european-business>.
- Riofrancos, Thea. “The Security–Sustainability Nexus: Lithium Onshoring in the Global North.” *Global Environmental Politics* 23, no. 1 (2023): 20–41. https://doi.org/10.1162/glep_a_00668.
- Robinson, Sophie. “Scale of conflict between mineral mines and indigenous peoples revealed.” *Institute of Development Studies*, August 9, 2023. <https://www.ids.ac.uk/news/scale-of-conflict-between-mineral-mines-and-indigenous-peoples-revealed/>.
- Shailer, Daniel. “9 years after mine spill in northern Mexico, new report gives locals hope for long-awaited cleanup.” *AP News*, September 29, 2023. <https://apnews.com/article/copper-mine-sonora-mexico-spill-pollution-eff24daec766d4944ed2e990355ea43a>
- Silva, Luis and Siddharth Sareen. “The calm before the storm? The making of a lithium frontier in transitioning Portugal.” *The Extractive Industries and Society* 15, (2023). <https://doi.org/10.1016/j.exis.2023.101308>
- Smyth, Jamie, and Harry Dempsey. “Western nations join forces to break China’s grip on critical minerals.” *Financial Times*, September 23, 2024. <https://www.ft.com/content/2984ae03-df15-420b-89cc-9ad8337014a9>.
- S&P Global. “What is the Energy Transition?” *S&P Global | Market Insights*. February 24, 2020. <https://www.spglobal.com/en/research-insights/market-insights/what-is-energy-transition>.
- Southern Cooper. “Proyecto Tía María - SCC.” *Southern Copper Corporation*, 2024.

- <https://southerncoppercorp.com/proyecto-tia-maria/>
- Stuehlen, Christin, and Felix Anderl. “Transnational companies in environmental conflicts: Rio Tinto, anti-mining resistance in Serbia, and the contradictions of Europeanization.” *Z Friedens und Konfliktforsch* 13, (2024): 243 - 268.
<https://doi.org/10.1007/s42597-024-00114-5>.
- Tähtinen, Lauri, and Henry Ziemer. “A Specter Haunting Latin American Mining? Not So Fast.” *Center for Strategic and International Studies*, August 9, 2023.
<https://www.csis.org/analysis/specter-haunting-latin-american-mining-not-so-fast>.
- Turner, Julian. “Tia Maria: Peru’s commodity versus community dilemma.” *Mining Technology*, November 28, 2019.
<https://www.mining-technology.com/features/tia-maria-inside-the-commodity-versus-community-dilemma-in-peru/>.
- United Nations. *Policy Brief: Transforming Extractive Industries for Sustainable Development*. UN, 2021.
https://www.un.org/sites/un2.un.org/files/sg_policy_brief_extractives.pdf.
- Van Meer, Dominique, and Christos Zografos. ““Take Your Responsibility”: The politics of green sacrifice for just low-carbon transitions in rural Portugal.” *Sustainability Science* 19 (2024): 1313–1326.
<https://doi.org/10.1007/s11625-024-01519-0>.
- Voskoboynik, Daniel M., and Diego Andreucci. “Greening extractivism: Environmental discourses and resource governance in the ‘Lithium Triangle.’” *Environment and Planning E: Nature and Space* 5, no. 2 (2021).
<https://doi.org/10.1177/25148486211006345>.
- Wauters, Jasper, and Nikolas Hertel. “Critical Minerals Supply Chains: The Minerals Security Partnership and Trade-Related Challenges.” *White & Case LLP*, October 7, 2024.
<https://www.whitecase.com/insight-our-thinking/critical-minerals-supply-chains-minerals-security-partnership-and-trade>.
- Worlanyo, Adator S., and Li Jiangfeng. “Evaluating the environmental and economic impact of mining for post-mined land restoration and land-use: A review.” *Journal of Environmental Management* 279 (2021).
<https://doi.org/10.1016/j.jenvman.2020.111623>.