

Greening extractivism: Environmental discourses and resource governance in the ‘Lithium Triangle’

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journals.sagepub.com/home/ene**Daniel Macmillen Voskoboynik**

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Netherlands**Abstract**

The lithium extractive industry is expanding, as technological and economic shifts associated with climate change mitigation goals drive global demand for lithium-ion batteries. This article explores the case of the ‘Lithium Triangle’, a region of Latin America (spanning Bolivia, Chile and Argentina) that contains the world’s largest reserves, and where environmental conflicts associated with lithium mining have proliferated. Emphasising the centrality of discourse in resource governance, we analyse the discursive strategies employed by institutional actors seeking to promote and render acceptable lithium extraction in the region. We argue that such strategies reproduce imaginaries of prosperity and modernisation long attached to oil and mineral wealth, while at the same time introducing a novel association of mining with high-tech industries, ‘green jobs’ and ‘climate-friendly’ extraction, seeking to obscure the social and ecological costs of lithium production. This inaugurates an era of ‘green extractivism’, whereby intensive resource exploitation is framed not only as compatible with climate change, but indeed as necessary to its mitigation. Our findings contribute to ongoing conversations regarding post-fossil fuel ‘transitions’, by highlighting the contradictory character of mitigation strategies that rely on mineral-intensive development.

Keywords

Climate change, environmental conflicts, green extractivism, political ecology, resource governance

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Introduction

Mineral extraction has increased steadily over the last decades (Hickel and Kallis, 2019). Simultaneously, technological, legislative and economic trends, partly driven by responses to the climate and systemic ecological crisis, are reconfiguring the global socio-economic metabolism, opening new extractive frontiers (Arrobas et al., 2017). Contemporary industrial processes associated with low-carbon energy production are generating new material requirements, converting previously unvalorised elements into coveted commodities (Narins, 2017). Such commodities – sometimes described as ‘high-tech’ metals, ‘battery minerals’ or ‘transition minerals’¹ – have registered significant growth of both economic demand and political interest (Deetman et al., 2018; Deloitte, 2018). One recent study commissioned by the World Bank suggested that demand for key transition minerals (lithium, cobalt and graphite) could increase by around 500% by 2050 (Hund et al., 2020). Given their centrality in the technologies embedded in climate change mitigation strategies, transition minerals are expected to be at the forefront of future extractive landscapes (Arrobas et al., 2017). Growing demand for these materials energises environmental conflicts, as extractive activities intensify and new projects encroach on previously inaccessible or unexploited areas, particularly in the Global South.

Mining and fossil fuel extraction have been the subject of significant investigation in geography and political ecology. Research has widely documented, among other aspects, the impacts of extraction projects on territories and communities (e.g. Perreault, 2013); the complex responses of affected populations (Conde and Le Billon, 2017); and the political implications of such responses at multiple scales (Huber, 2019). However, the extraction of transition minerals – and other materials increasingly relevant to the ‘green’ economy – has received comparatively little attention. This will likely become a central focus of interest in the discipline in the coming years, as part of a broader, emerging research agenda on the relationship between resource extraction and climate change (Odell et al., 2018). Exploring such a relationship is an urgent task, particularly given that low-carbon energy systems, deemed indispensable by virtually all climate change mitigation plans – including ambitiously transformative plans such as the Green New Deal in the US – are significantly more ‘metal-intensive’ than fossil-based energy systems (Arrobas et al., 2017; Zografos and Robbins, 2020).

In this article, we contribute to emerging research around the intersections of resource governance and climate change by focusing specifically on the regulation of ‘transition minerals’ mining, and on the role of discourse in such regulation. We do this by examining the case of lithium, a material whose prominent use in battery storage technologies is considered highly relevant to low-carbon transitions. While lithium is representative of the broader trend in the increased relevance of transition minerals described above, it is also unique in that its extractive process lends itself to it being framed as ‘green’ or environmentally benign, in ways that other such materials such as cobalt or nickel do not.

Moreover, public debates surrounding lithium provide particularly fecund terrain for discursive analysis: with profoundly uncertain future demand, and a relatively novel extractive history, discussions of lithium have been prone to inflated expectations, highly mystified narratives and grandiose imaginaries (Barandiarán, 2019; Revette, 2017). Although abundant across the biosphere, lithium, in its most accessible and easily obtainable form, is concentrated in few areas (Narins, 2017). One of these is known as the ‘Lithium Triangle’, a geographical region stretching over north-western Argentina, south-western Bolivia and north-eastern Chile, which hosts the world’s largest lithium reserves.

The scale of the reserves in the area, the emerging disputes (e.g. Anlauf, 2016) and the commercial interest in the region encourage us to narrow our empirical focus to this region.

The interrogations of this paper circle around a central challenge faced by extractive projects: legitimisation. Centring on a case study of the Lithium Triangle, this article examines how resource extraction is rendered acceptable in spite of its associated socio-ecological costs (Frederiksen and Himley, 2019). Drawing on critical theories of resource governance (Andreucci, 2017; Bridge and Perreault, 2009) and on work into discourses and imaginaries related to resource extraction (Bridge and McManus 2000; Perreault and Valdivia, 2010), this paper aims to account for emerging discursive dynamics at the intersection of development and climate change mitigation, in order to understand and the role of such dynamics in the regulation and legitimisation of transition mineral mining.

With growing globalised awareness of the socio-ecological costs of extractivism, extractive firms and state actors supporting them have increasingly sought to anchor their own legitimacy in the language of ‘sustainability’ (Himley, 2010; Kirsch, 2010; Onn and Woodley, 2014). Multilateral bodies and states have also embedded environmental dimensions into their discursive frameworks, and actively participated in the crafting of ‘green hegemonies’ (Goldman, 2005). As demand for mined materials linked to ‘green’ technologies augments, however, there is a need to better understand how ecological imaginaries relating to climate change and decarbonisation are influencing discursive strategies around lithium.

Deploying a qualitative methodology, this study analyses 117 documents produced or published between 2005 and 2018.² This paper adopts a theoretical sampling strategy, with documents collected from an extensive array of sources across the region of study, based on a rationale of relevance and representativeness, to reflect the broad nature of the debate on lithium. The documents include primarily public statements by political leaders of the three countries in the period considered, laws, parliamentary proceedings, press releases, corporate websites and public marketing campaigns. They were analysed using qualitative analysis informed by Foucault’s theory of discourse (Feindt and Oels, 2005), in order to present the most salient ‘discursive strategies’ (Andreucci and Kallis, 2017; Carabine, 2001; Winkel, 2012) related to the governance of lithium. The document analysis was complemented by a thorough review of secondary scientific and ‘grey’ literature, notably environmental organisations’ reports on socio-environmental issues and conflicts related to lithium extraction in the three countries.

There are noteworthy differences between Argentina, Bolivia and Chile’s lithium extractive regimes (Heredia et al., 2020): Bolivia has prioritised a state-led development approach towards lithium coupled with nationalisation and industrialisation; Argentina has a relatively new interest in lithium that is being pursued at the federal level; while Chile has for decades considered lithium a ‘strategic resource’, with mining concessions managed by the Chilean state Corporation for the Development of Production (CORFO) (Obaya and Pascuini, 2020). While recognising the significance of such differences, and highlighting the specificities of each context, this analysis has treated all three as a singular region, looking to identify discursive patterns common to lithium. The rest of the article makes the following arguments: In the next section, we discuss the role of discourse in environmental governance and argue that it is an important aspect of how resource extraction is rendered acceptable; we also posit that the discursive strategies adopted by dominant actors both draw upon and contribute to shaping pre-existing imaginaries. Section ‘The political economy and ecology of lithium extraction in the Triangle’ suggests that lithium expansion in the Triangle is likely to be very significant to the region’s politics and development in the coming years, but also that it is already a source of tensions and a driver of dispossession of local populations, primarily due to its extremely high water usage (Bustos-Gallardo

et al., 2021). In section ‘Lithium discourses and imaginaries’ we present the findings of our analysis. These demonstrate that institutional actors promoting lithium exploitation in the Triangle seek to construct lithium discursively in ways that associate it with development, national affirmation and environmental sustainability. Lithium discourses reproduce imaginaries of prosperity and modernisation long attached to oil and mineral wealth, while at the same time introducing a novel association of mineral exploitation with high-tech industries, ‘green jobs’ and climate-friendly extraction. As we argue in our final section, this inaugurates an era of ‘green extractivism’, whereby intensive resource exploitation is framed as not only compatible with climate change, but indeed as *necessary* to its ‘mitigation’. We conclude by sounding a note of caution against techno-optimist narratives of post-fossil fuel ‘transitions’, whose social and environmental burdens are rendered invisible in mainstream discursive strategies.

Resource governance, discourse and imaginaries

Governance of resource extraction

The central problem addressed by this paper is that of the governance of resource-based accumulation and development. Mining in particular, given the overt ‘tension[s] of territorialities’ implicit in its procedures (Porto Gonçalves, 2001), offers emblematic examples of contested resource governance. There is abundant research dedicated to analysing and uncovering a multiplicity of mechanisms through which the extractive activities are enabled and rendered governable. As Frederiksen and Himley (2019) argue, in order to maintain stability of accumulation in extractive sectors, in the face of its own socially and environmentally destabilising effects, the industry relies not only on coercion and domination but also on approaches based on ‘quieter registers of power’, including ‘manipulation’, ‘persuasion’ and ‘seduction’. This gives rise to a panoply of strategies through which states, firms and multilateral institutions deal with or seek to pre-empt the discontent of local communities, including participation, consultation, rent distribution, benefit sharing and a host of CSR and local development programmes and initiatives (Perreault, 2015; Schilling-Vacaflor and Eichler, 2017; Vela-Almeida et al., 2021).

In this article, we address the question of extractive legitimation by drawing on critical theories of resource governance. Informed by ‘regulation theory’, political ecology approaches to governance seek to explicate how accumulation in the extractive industries is stabilised in the face of contradictions related to their use of the environment and to their socially problematic outcomes (Bridge and Perreault, 2009). Regulationist approaches conceptualise economic processes of resource extraction as socio-politically embedded. They posit that, in order for the continuity of an accumulation system or process to be secured, it requires coupling with a ‘mode of social regulation’. The latter refers to the ‘constellation of institutional forms and social practices that function to guide and stabilize – or *regularize* – accumulation for more or less extended periods’ (Himley, 2013: 397). The institutional forms that regulate uses of nature are not necessary or predetermined, but are the contingent and changing outcome of conflicts and negotiations between competing interests.

In all contexts, but notably in environmental conflicts, these institutional arrangements are disputed, reworked and adjusted. State representatives or transnational corporations, in order to maintain or further their interests, are left with the challenge of negotiating, reformulating or even suppressing the interests and expectations of diverse actors. Not only is governance in this sense understood as a product of socio-political struggle, this approach ‘entails an understanding of governance mechanisms as instruments of power that

may serve to delimit the terrain of that struggle, including by shaping the behaviour of those who might seek to contest or make claims on the extractive economy' (Himley, 2013: 399). This points to the need to analyse the ways that the concerns and claims of less powerful actors are marginalised, limited or side-lined (e.g. Horowitz, 2017).

Regulation and discourses

Discourse is a central element in the regulation of resource-based accumulation. Mining conflicts are not just struggles over territories and their resources, but nodes within broader contests over knowledges, worldviews, identities and the configuration of development. Political ecologists have amply documented the ways in which corporate and state actors use discourses within territorial contests to safeguard and maintain modes of resource and rent extraction (Andreucci and Kallis, 2017). As Bridge and McManus (2000: 20) put it, 'environmental discourses represent a significant component of a mode of regulation that may be emerging to stabilize contradictions inherent to the relationship between [extractive] capital and the environment'. They define discourses as 'dialectically constituted, often ephemeral, yet frequently potent codifications of the social relationships within which the production and transformation of nature are embedded' (Bridge and McManus, 2000). Referring specifically to the appropriation of sustainability discourses on the part of environmentally destructive industries such as mining and forestry, they argue that the aim of such discourses is to facilitate 'the requisite degree of certainty and stability in the accumulation process by creating coalitions of interest that support, or at the very least do not oppose' resource-based development (Bridge and McManus, 2000: 21). The last argument points to the centrality of discourse in the creation and stabilisation of 'resource regimes' that regularise extraction (Marston and Perreault, 2017).

Understanding resource extraction and control thus requires methodological approaches that examine both the material and symbolic dimensions of governance. The concept of discourse has gained salience in political ecology, often in alliance with the broader framework of 'eco-governmentality' (Valdivia, 2015). While a Foucauldian analytic is in many ways different from regulation theory, there are important commonalities and convergences between the two (Sum and Jessop, 2013). A governmentality approach shares with regulationist theories of environmental governance an interest in how 'people and things' become aligned with political objectives, in ways that facilitate their administration and rule (Bridge and Perreault, 2009: 488). Discourse is itself a 'social regulatory mechanism' and 'a form of disciplinary power by which the order and stability of society is assured' (Bridge and McManus, 2000: 20). Following Foucault's theoretical impetus to examine the ways in which 'power/knowledge' regulates society, and is articulated through multiform tactics that extend beyond the state, political ecologists have devoted attention to how discourses can circumscribe possibilities, legitimate particular social rules, normalise or exclude ideas and enable political projects (Valdivia, 2015). In a specifically Foucauldian understanding, discourse is constitutive of reality and is fundamental to delineating legitimate knowledge that comes to be accepted as the 'truth', while at the same time disqualifying alternative, 'subjugated' knowledges and related subjects (Feindt and Oels, 2005).

Imaginarities

Political ecologies of resource contentions and governance often stress the relationship of extraction with *imaginarities*. The concept of imaginary originates in Lacanian psychoanalysis and in the philosophy of Castoriadis; however, as Derek Gregory (2009: 282) notes, in

geographical research it ‘is rarely given any formal theoretical inflection’. Authors who mobilise it note resemblances with notions such as Said’s ‘imaginative geographies’ or Anderson’s ‘imagined communities’, but tend to then use the concept in descriptive ways, primarily to mean a taken-for granted, shared vision of the world (Gregory, 2009). Imaginaries express collective visions of what is good or undesirable, and are crucial in forming public expectations of collective futures (Jasanoff and Kim, 2015). Reflecting hegemonic interests, norms and ideologies, imaginaries may contribute to advancing projects, stabilise ideas and order values.

Researchers have mobilised the concept to show how imaginaries sustain public visions of science, economics and the environment. Jasanoff and Kim’s (2015) notion of ‘socio-technical imaginaries’, for instance, has been influential in explaining how infrastructural projects and technologies are legitimised – an approach which has also been applied to the study of lithium politics in the Triangle (Barandiarán, 2019) and to other extractive industries (Kuchler and Bridge, 2018). The role of national imaginaries in contests over resource extraction has also been studied and interpreted in various contexts (Bouzarovski and Bassin, 2011; Perreault and Valdivia, 2010; Watts, 1999). In relation to the area of our study, further work by Sánchez-López (2019) has elucidated how the symbolic meaning and social understanding of the Uyuni salt flat landscape in Bolivia has been transformed by the encroachment of new materialities in the region as a result of the expansion of the lithium industry.

For the purposes of this paper, we maintain our primary analytical focus on discourses. Imaginaries are the broader canopies of ideas and vocabularies under which discourses, more explicit and intentional, operate. Although the boundaries between discourses and imaginaries are fuzzy, we distinguish discourses as conscious and directed efforts to produce ‘true’ knowledge, and to limit the discursive space. Although discourses are more actively produced and disputed, imaginaries are largely received, in more or less passive ways (in this sense, they are perhaps more akin to Gramsci’s notion of ‘common sense’; see García López et al., 2017). We posit that discourses draw upon and contribute to shaping and articulating imaginaries. In this sense, unlike ‘imaginary’, a focus on discourse allows us to understand knowledge production as imbued with power. Specifically, by using the derived notion of ‘discursive strategy’ – which refers to the ways a discourse is deployed and given force (Carabine, 2001: 288) – we will place emphasis on the conscious efforts on the part of dominant actors to impose their own view of development, nationhood and the environment.

Section ‘Lithium discourses and imaginaries’ will demonstrate empirically how discourses around lithium development interrelate with imaginaries. Before delving into the analysis, however, in the next section, we briefly introduce the political economic and geographical context to lithium development in the Triangle.

The political economy and ecology of lithium extraction in the Triangle

Although lithium was first discovered in the early 19th century, its commercial extraction only gathered traction following World War Two, as it began to be used in jet propulsion and the development of thermonuclear weapons. Gradually, lithium was also incorporated into the production processes of ceramic, aluminium and pharmaceutical industries. Demand, however, remained relatively minor until the 1980s, when research pioneered its use in more efficient electric batteries; lithium-ion batteries were launched in the 1990s and

gradually introduced in consumer electronics (Gómez Lende, 2017). Today, lithium-ion batteries are fundamental components in digital equipment, electric cars and power storage systems. The internal chemistry of lithium – light, conducive and energy-dense – allows it to recharge electricity quickly and efficiently, with lithium-ion batteries being multiple times more energetically-efficient than a nickel–metal hybrid equivalent (Perotti and Coviello, 2015).

These appealing properties have positioned lithium as a commodity central to the future of the energy, electronics and automobile industries. With surging demand for electric vehicles, consumer battery-powered electronics and renewable electricity storage systems, lithium prices, investments and production rates have swollen in recent years (Narins, 2017). Economic forecasts project even more significant growth over the next decades, as companies and countries vie to increase production, and accrue greater shares of the global market.

The ‘Lithium Triangle’

Lithium is among the planet’s most abundant minerals and is widely dispersed across the globe in different forms: hard pegmatite rock, geothermal reserves, petroleum, continental brines, clays and marine saltwater (Narins, 2017). The most economically viable forms of lithium extraction involve brine and hard-rock deposits, both of which are more concentrated, with significant reserves found in Australia, the United States and China. The world’s largest reservoir of lithium is situated in the region known as the ‘Lithium Triangle’, with estimates suggesting it could contain between half and four-fifths of global lithium reserves (Zicari, 2016). The Uyuni salt flat (Bolivia), the Atacama salt flat (Chile) and the Hombre Muerto salt flat (Argentina) represent the largest deposits of brine-based lithium in the Triangle area. The deposits in these salt flats, particularly in the Atacama region, are distinctive for their extractive quality, given their high concentration of lithium, and the low costs of extraction.³

The nature of extraction, and the ability to rely on solar exposure renders the lithium-rich brines of the Triangle cost-effective and energy-effective in comparison to other lithium deposits (Grágeda et al., 2015). Yet extracting lithium from brines requires industrial processes with intensive capital investment and expensive technological development, a challenge for the countries of the Triangle. Although the number of private companies and state ventures has proliferated (Narins, 2017), the majority of lithium extraction remains concentrated in the hands of few, largely historic companies such as Albemarle and FMC (US), Sociedad Química Minera (SQM, Chile), Tianqi and Ganfeng (China) (Gómez Lende, 2017).

Major discoveries of lithium in the Triangle took place in the 1960s, and the first exploration and extraction projects, motivated by the use of lithium in aerospace, nuclear and military technology, were soon undertaken in the Atacama and north-western Argentina (Argento et al., 2017). But only as electronics-driven demand began to emerge in the 1990s, and particularly around the late 2000s, did the area of the Lithium Triangle receive high-level political attention.

Lithium politics

The last decade has seen a burst of state-led development programmes, stakeholder dialogues, private investments and awarded concessions. Although this analysis contemplates the ‘Triangle’ as a whole, it is important to recognise the differences in lithium development strategy across the three states. Major divergences relate to extractive histories, political

orientations, the parameters of public debate and the degree of consensus around the role of the state in lithium extraction (Riva Palacio, 2012).

Under the progressive administration of Evo Morales (2006–2019), Bolivia favoured a state-led development and extractive policy, focused on recuperating public control of national resources. Since then, the Bolivian state has prioritised lithium-driven industrialisation, investing millions to foster a national lithium industry that can optimize the material's added value by elaborating batteries, battery-reliant products, and other lithium-based goods (Revette, 2017; Sánchez-López, 2019). Although the state company YLB (Bolivian Lithium Deposits) controls the full supply chain of Bolivian salt flats, the state has arranged a handful of strategic joint partnerships with foreign companies. Yet despite significant state efforts, plans to industrially produce lithium remained delayed by difficulties in developing an efficient model for large-scale extraction in Uyuni (Fornillo, 2018; Narins, 2017).

In Chile, lithium has been extracted since the 1970s, when government decrees and constitutional changes designated lithium as a 'strategic resource', reserving to the state the right to its exploitation and commercialisation (Göbel, 2013; Lagos, 2012). As interest in lithium grew, the country was riddled with debates concerning how to update these regulations, and potentially expand the involvement of private enterprise in lithium extraction. Recent administrations supported legislative and university-led efforts to generate greater opportunities for the exploitation of lithium. In 2014, then President Michelle Bachelet (2006–2010 and 2014–2018) took a further step in creating the National Lithium Commission, mandated to develop a comprehensive and sustainable lithium policy. In 2018, the right-wing administration led by Sebastián Piñera (2018–present) expressed interest in reforming the country's lithium regulation, and rapidly growing the industry.

In Argentina, although large-scale lithium extraction was initiated in the 1990s, it gained prominence during the administrations of Nestor and Cristina Kirchner (2003–2015), which positioned mining at the heart of economic development (Carrizo et al., 2016). Between 2003 and 2015, the number of mining projects in Argentina rose from 40 to 800 (Aranda, 2017). The country's lithium panorama would develop further under neoliberal President Mauricio Macri (2015–2019), who aimed to stimulate foreign investment by relaxing foreign capital rules, eliminating mining royalties and allocating major concessions. Argentina's lithium development plans under Macri involved initiatives to rapidly accelerate investment, in order to gain a competitive advantage over Chile and Bolivia, where restrictions on private sector presence were higher (Fornillo, 2018). Today, Argentina's role in the global lithium industry is increasing, having become one of the world's fastest growing producers (Roskill, 2019). By 2017, at least 63 lithium extraction projects were established across 873,000 hectares, with virtually all of the country's north-western salt flats covered in concessions (Ministry of Energy and Mining [Argentina], 2017). Overall, at the time of writing, large-scale lithium exploitation is underway in Argentina and Chile (in the Atacama and Olaroz-Caucharí salt flats), with a flurry of exploratory and pilot projects elsewhere.

Territorial tensions

The Andean salt flats of Argentina, Chile and Bolivia are arid highland environments that have been home to human settlements for millennia, including the Lickanantay (Atacameños), Kolla, Quechua and Aymara peoples (Gundermann and Göbel, 2018; Mora Rodríguez and Cayo Rivera, 2017). These communities have traditionally relied on agriculture, livestock rearing and small-scale commerce. The region's mineral-rich terrains have also been sites of extraction dating to before the Incan empire, when workers extracted ores from the mountains and salt from the salt flats (Campos Ortega and Jorquera

Jaramillo, 2008). With the advent of colonisation, the region would become a frontline of contestation over extractive resources, reaching its most violent apex in the late 19th century during the War of the Pacific (or Saltpetre War). Since then, the region has undergone numerous waves of commodification, with reforms and economic projects gradually regularising many of its territories into zones of extraction, generating ecological conflicts linked to silver, copper and tin mining projects among others (Carrizo et al., 2016; Larrain and Schaeffer, 2010).

Today, many of the extractive concessions awarded to lithium companies overlap with ancestral indigenous territories, communal lands and protected ecological areas. The extraction of lithium in the Triangle has also been associated with multiple ecological risks, involving waste generation, landscape change, contamination of surface salts and water bodies, and impacts on flora and fauna (Calla Ortega, 2014: 25–40; Wanger, 2011). The central impact of lithium extraction however relates to water use, for it involves the extraction of significant volumes of water from below the salt flats (Bustos-Gallardo et al., 2021). As geologist Fernando Díaz summarises, ‘lithium mining in salt flats is little more than a mining of water’ (cit. in Eleisegui, 2016). It takes approximately two million litres of water (2000 m³) to obtain a tonne of lithium (Bertone, 2013). Lithium mining’s water footprint gains greater relevance in the Triangle, for the territories that compose it are known for their extreme aridity, marked by intense solar radiation and highly limited precipitation (Puente and Argento, 2015). In such environments, local communities have historically forged viable yet precarious agrarian livelihoods. But these livelihoods are under threat as climate change and water-intensive economic development encroach on limited water reserves and exacerbate hydrological vulnerabilities (Bode and Rizzuti, 2018).

The contamination risks and water consumption levels of lithium projects add to these concerns. Estimates have suggested that residents across the entire Argentine region of the Puna (encompassing the country’s segment of the Triangle) consume a third of the water used by lithium company FMC in the same year (one million cubic metres to three million) (Mignaqui and Lacabana, 2018). Although several state authorities have alerted to the risks of lithium extraction, affected communities have criticised the absence of comprehensive environmental assessments around authorized projects. Scholars have warned that the potential consequences of large-scale lithium mining are largely unknown and unstudied, with major uncertainties remaining in particular around the impacts of extraction on hydrological cycles (Anlauf, 2016; Fornillo, 2018).

These socio-ecological risks – coupled with longstanding concerns over the political role of foreign multinational companies – have catalysed notable opposition to lithium extraction over the last decades. In the 1980s, when mining firm FMC tried to expand its production in the Uyuni salt flats following an offer by Bolivian President Jaime Paz Zamora, intensive communal, civic and parliamentary resistance prevented any viable exercise of the project (Fornillo, 2018). In more recent years, communities in the Atacama and the Salinas Grandes regions have organised significant opposition to lithium enterprises, stalling projects through roadblocks, hunger strikes and judicial actions (Schiaffini, 2014). Activists and lawyers have denounced irregularities in the authorization of lithium concessions, incidents of contamination and a failure to adequately adhere to the right of indigenous communities to processes of free, prior and informed consent regarding territorial projects (Martín-Cabrera, 2018). Further concerns have erupted around the involvement of lithium enterprises in political corruption.

Despite such opposition and controversies, states and companies have been largely successful in extending lithium extractive regimes in the Triangle. The multiplication of new lithium projects, the approved extension of existing sites and significant changes in

legislation are testament to this achievement. Although we cannot neatly demarcate the contribution of discourses to these processes given their intertwinement with economic materialities (Sum and Jessop, 2013), the salience and deployment of particular narratives is likely to have sustained the expansion of lithium regimes. In the next section, we present an analysis of such discourses and the imaginaries they seek to shape.

Lithium discourses and imaginaries

This section presents the three main discursive strategies adopted by institutional actors in the Triangle. In reality, these discursive strategies intertwine and overlap, but we present them here separated for the sake of clarity. The first strategy frames lithium exploitation as a vehicle for reaching wealth, inclusive development, industrialisation and modernisation; the second construes it as a way of (re)affirming national sovereignty, integrity and prosperity in a competitive resource geopolitics; and the third stresses lithium's key role in climate mitigation, and its environmentally benign extraction process. We conclude the section by presenting some of the counter-discourses put forward by dissident organisations and actors in the region.

Development and modernity

The first discursive strategy adopted by institutional actors constructs lithium extraction as pivotal to national development. Designating citizens as the ultimate beneficiaries of extraction, this discursive strategy draws on traditional economic discourses to position mining investments and projects as instruments to deliver riches, stimulate growth and create jobs. Discourses around lithium reiterate and attempt to solidify the mining-development nexus: the association of mining with wealth and socio-economic progress. Across the Triangle, lithium is largely conceived through an imaginary of abundance, imbued with near-hyperbolic attributes and 'magical' qualities that conjure visions of easy wealth (see Coronil, 1997).

The sheer size of reserves in the Triangle, and comparisons to territories rich in gold and petroleum, are repeatedly invoked to emphasise the extent of possible obtainable wealth. The imagery of rushes, extractive fevers and bonanzas is recurrent. This is reinforced through bold and effusive public statements, linking lithium to 'revolutions in employment' and 'explosions' of public wealth. For instance, while giving a public address in Jujuy in 2017, then Argentine President Mauricio Macri described lithium as the 'greatest development that will occur in the world' (cit in. Bullorini, 2017). These portrayals all serve to lend lithium an imprimatur of unprecedented and unimaginable possibility.

Developmental discourses surrounding lithium are both backward-looking and futuristic, with the mineral being both a corrective of the past and vehicle to a prosperous future. Constantly described by all types of actors as 'white gold', 'the new copper', or 'the 21st century's petroleum', lithium gains legitimacy through comparisons that symbolically charge it with the gravitas of the past, and the promise of the future. As former Chilean president Michelle Bachelet observed:

Lithium is a mineral with such an important future, that some have even called it 'the white petroleum of the 21st century', a resource that puts Chile in a position of privilege before the world, an opportunity that we do not have the luxury of wasting or misspending. (Presidency of the Republic [Chile], 2015)

Across state and industry-led discourses in all three countries, lithium is presented as a mineral with limitless futuristic qualities, pivotal to the societies of the future, and central

to emerging technologies. Lithium is repeatedly linked to digital modernity, projected as a material opportunity for countries to enter into the industrial production of high-grade technologies and to participate in a high-tech economy energised by innovation that is competitive on a global scale. The imagery of national factories producing electric cars is commonly summoned, with lithium marking a new era where ‘lithium-fuelled Toyotas’ will be made domestically (El Mundo, 2011). The association of lithium with advanced clean technology invokes a ‘dreamscape of modernity’ (Jasanoff and Kim, 2015), where lithium offers a linear springboard to a modernised knowledge economy.

Actors with diverse and even countervailing political strategies in relation to lithium demonstrate significant discursive similarity. The geologist and Argentine regional politician Ricardo Alonso for example is credited with pioneering the metaphor of the Triangle as ‘the Saudi Arabia of Latin America’, having created it as Secretary of Mining for the province of Salta to attract private investment (La Nación, 2014). This discourse was then repackaged and reiterated by financial journalists and investment companies, adopted by companies, promulgated by political parties of various different ideological affiliations and then incorporated into mainstream ideas about the mineral. The optimistic rhetoric of financial firms such as Goldman Sachs, baptising lithium as the ‘new gasoline’, was quickly incorporated into the discourses of state bodies of varying political orientations.⁴

In less futuristic variations of this discourse, lithium is legitimised as a platform for genuine industrialisation, a chance to increase the added value of exports and abandon previous approaches geared towards merely exporting raw materials without reaping larger benefits. This aspect is emphasised primarily in the Bolivian context, due to the state-led developmentalist orientation of the country under Morales (Revette, 2017). For instance, former Mining and Metallurgy Minister Cesar Navarro described the approach of his government as ‘a qualitative leap; that is, we aren’t [acting] as the old Republican state, exploit, concentrate, and export; today we are developing the lithium industry in our own territory’ (Ministry of Mining and Metallurgy [Bolivia], 2016).

The ample future prospects of lithium come hand-in-hand with reflections on the past. Lithium projects are frequently legitimised as unique opportunities to make amends for previously negligent extractive approaches and reroute a country’s developmental trajectory. As Bachelet affirmed in January 2016: ‘I am confident that Chile’s lithium will not be a case of frustrated development but an example of a well-built future’ (Government of Chile, 2016). Proposed lithium projects across the region have been positioned as alternatives to previously fraught mining industries, such as Chile’s saltpetre industry, or the silver mines of Potosí, which wrought horrific consequences and precipitated economic ruin following commodity crashes.

National sovereignty and prosperity

The second discursive strategy associates lithium exploitation with nationhood, prosperity and international standing (Koch and Perreault, 2018). Álvaro García Linera, Bolivia’s vice-president under Evo Morales, would describe Uyuni, the country’s largest salt flat, as ‘our bank of the 21st century,’ the location of ‘Bolivia’s destiny’ (cit. in Sputnik, 2016). The size of lithium reserves is consistently extolled as representative of the bounty of the nation’s patrimony. Then Bolivian president Evo Morales noted in a social media post in early 2018 that

Our lithium reserve is the largest on the planet. After nationalization we have entered the era of industrialisation. [Soon] Bolivia will regulate the price of this mineral for the world. It’s an achievement of the work and unity of the people. (Morales, 2018)

While, as noted above, emphasis on nationalisation and industrialisation characterise most typically the state-developmental orientation of Morales's Bolivia, such resource nationalist discourses are omnipresent across the Triangle, tying the development potential of lithium to a broader story arc about a country's trajectory.

National and provincial pride is also fortified through references to the litany of different states and multinational corporations interested in the country's domestic resources. Gerardo Morales, governor of the lithium-rich Argentine province of Jujuy, publicly celebrated the 'formidable multiplying capacity of expected [foreign] investments' in lithium, that will guarantee 'the presence in Jujuy of international business groups with a strong position in the global market', and 'will trigger an auspicious process of development' (cit. in *AméricaEconomía*, 2017). In its diverse guises, the discursive power of resource nationalism is so strong, that even critiques of lithium policies are largely anchored in discourses of 'gifting away national wealth' or squandering the country's heritage.

The need to ratify and expand lithium projects is also constructed through a nationalist imaginary of geopolitical competition, where lithium is represented as a central source of power in a global race for wealth and power. The narrative of a 'geopolitical race' where states cannot fall behind and lose their competitive edge in the 'lithium window of opportunity', originates in lithium trade bodies to then become a mainstay of state discourse. In this scramble for lithium production leadership, countries cannot lose their chance to achieve prominence in a new energetic order, where states controlling the lithium supply will be the 'new Saudi Arabia', blessed with extravagant riches and the arm-wrestling might of OPEC. Bolivia's former vice-president Álvaro García Linera repeatedly called for Bolivia to 'play a monopolistic role in the production of lithium and lithium batteries', predicting publicly that 'between 2019 and 2020, when consumption [of lithium] will be increasing, Bolivia will define the price of lithium in the world, just as the United States and Saudi Arabia do now with the price of petroleum' (cit. in *Energía Bolivia*, 2016; *Sputnik*, 2016).

Proposed lithium development plans have also been presented as innovative models for reconciling local interests, addressing intra-national inequalities and building international alliances across Triangle states. Former Chilean Minister of Mining Aurora Williams would reflect that 'lithium gives [Chileans] the opportunity to build a scenario of wealth in a reflexive and dialogued way, hand in hand with the capabilities of [Chilean] industry and thinking of the common good' (cit. in *Periódico El Industrial*, 2016). When promoting a legislative project to develop lithium extraction, Argentine deputy Carlos Heller made a clear distinction: 'We are not saying "no to mining", we are saying "yes to rational mining", within determined exploitation rules and overall ensuring that the interests of our country are duly protected' (cit. in Aranda, 2015).

Lithium is also framed as an opportunity to tighten the fabric of the state through integrating peripheries. Such strategies are facilitated by both the marginal roles that regions like the Atacama and the Argentine Puna occupy in their respective national imaginaries, and by the fact that in discursive depictions of the Triangle, the area's territories are framed as 'barren' and 'under-developed' hinterlands. As an influential *Forbes* article (Koerner, 2008) recounted:

Nothing grows in the heart of the Salar de Atacama. This ancient Chilean lake bed 700 miles north of Santiago may be the driest place on Earth, a wasteland . . . Humans would steer clear of the Salar de Atacama were it not for the precious brine that bubbles 130 feet below its surface . . . This greasy solution yields the substance that makes modern life possible: lithium.

These discourses help construct an 'imaginative geography' (Gregory, 1995) of the Triangle as an area of impoverished emptiness, in need of being rendered productive through

extraction. The widespread use of a neologism such as the ‘Lithium Triangle’ is evidence itself of the dominance of an economistic vision of territory defined by its extractive potential (Jerez, 2017).

Environmentally benign and climate-friendly extraction

Finally, institutional actors promote lithium development as something that is both environmentally benign and virtuous. Across all three states in the Triangle, officials have emphasised lithium’s role in a new and different type of mining that is ‘sustainable’, ‘contemporary’, ‘responsible’, ‘reflexive’ and adapted to the 21st century. Diverse terminologies – from a ‘dialogued mining’ to an ‘intelligent mining’ to a ‘mining for the ‘common good’ – place lithium in firm opposition to previous mining regimes, associated with socio-ecological carelessness, or the prolongation of exploitative developmental models.

Most crucially, in the Lithium Triangle, extractive projects are discursively wedded to a strong ecological imaginary. Narratives of climate change, sustainability and the ‘green economy’ are mobilised in discursive strategies aiming to legitimise lithium extraction projects. In addition to conventional discourses emphasising the importance of sustainability in resource extraction, discursive strategies in the Triangle tap into (and contribute to producing) new imaginaries of climate friendly development, ecological industrialisation and techno-renewable futures. This significantly differentiates discourses around lithium from other forms of resource extraction.

While attempts to present mining and hydrocarbon extraction as sustainable have long taken place (Andreucci and Kallis, 2017), in the case of lithium two circumstances make these discursive strategies especially salient. First, lithium’s unique materiality and mode of extraction make it amenable to being discursively framed as ‘eco-friendly’. The properties of resources shape the systems through which they are governed, and the discourses that sustain them (Kuchler and Bridge, 2018). Across the analysed discourses, lithium is frequently framed as an environmentally benign resource, differing significantly from more impactful extractive resources such as ores or fossil fuels. One legislative bill to promote lithium development proposed by Argentine deputies remarked that the impacts of lithium extraction on ‘health and territorial-environmental integrity’ are ‘far lower than any other energetic alternative’ (cit. in Aranda, 2015). Given this benignity, lithium is portrayed as a model mineral, exemplifying how extraction can be done equitably and sustainably.

Second, lithium extraction is also signalled as a robust response to climate change, with state pronouncements and industry discourses emphasising the relationship between lithium, its use in electric vehicles and renewable energy storage and subsequent reductions in carbon dioxide emissions. As Sociedad Química y Minera (SQM, 2018), one of the major extractive companies in the Triangle, notes on its website:

The climate change our planet suffers is the main decisive challenge for development in the 21st century. The transport of people today is the main reason for oil consumption in the world, the source of CO₂ emissions that has grown the most... Lithium batteries... are designed to store large quantities of energy and be recharged constantly... reducing [emissions]. SQM satisfies today close to 35% of global demand for lithium, powering an industry which generates less impacts on the environment.

Lithium’s implicit association to ‘clean’ technologies make it highly pliable to imaginaries associated with socio-environmental benignity and prosperity. The purported ecological qualities of lithium’s use are extended to its extractive process. The socio-environmental

burdens of lithium mining are invisibilised through an association to imaginaries of cleaner, modernised societies.

Various lithium development plans, particularly in Chile, have also stressed the potential for synergies between extraction and clean energy, with lithium able to provide the tools for renewable energy generation. During the announcement of a lithium extraction agreement between the Chilean state and a subsidiary of state-owned copper mining firm CODELCO, former Chilean Minister for Mining Aurora Williams suggested that

[t]his contract opens opportunities for the country, as it will enrich the positive synergy . . . in which copper, lithium and solar energy are interacting. The prospects for the extraction of the mineral are favourable given growing demand relating to electro-mobility and the energetic challenges posed by the struggle against climate change. (cit. in Radio Regional Atacama, 2018)

In what may be considered a case of ‘resource internationalism’, the potential contribution of lithium extraction to climate change mitigation is also discursively emphasised as beneficial to the global community. Evo Morales has described lithium as a ‘hope not just for Bolivia but for all the inhabitants of the planet’ (cit. in Bajak and Valdez, 2009), while Eduardo Bitra, vice-president of the Chilean state’s Corporation for the Development of Production (CORFO) noted that, ‘[f]or us, for society, for the world and for climate change it is beneficial that this lithium is not just thrown away’. (cit. in ADN Radio, 2018)

Counter-discourses

Although our analysis has focused on institutional actors and their discursive strategies, it is also important to note that attempts by dominant actors at achieving consent and ‘discursive closure’ did not go unchallenged. Understanding the ways in which the lithium industry is discursively legitimised also requires understanding the ‘subjugated knowledges’ (Foucault, 2003) and ‘counter-discourses’ advanced by local indigenous and environmental movements.

First, these organisations’ declarations explicitly take aim at lithium’s ecological reputation. As the Defend the Salt Flat movement, for instance – a prominent actor in movements resisting lithium projects (cit. in, Butcher, 2017) – affirmed:

lithium batteries are not ecologically sustainable and their ecological footprint has for too long been ignored. As long as we continue to obtain lithium by extracting huge quantities of water from the aquifers of the Atacama salt flat . . . it is our conviction that over-exploitation of these aquifers constitutes a direct threat to the variety of life forms that develop in this ecosystem.

Second, these counter-discourses also directly challenge the dominant ‘imaginative geographies’ at play, countering the colonial vision of a Lithium Triangle as a lifeless extractive enclave serving as a site of resource exploitation. Instead, they reaffirm the complex social and ecological value of the salt flats, which have served as sources of life to the local communities over millennia. As Clemente Flores, a representative of the Kolla community of Jujuy (Argentina), explains: ‘For state officials and impresarios the salt flats are a simple resource to exploit and obtain profits. For us indigenous (*originario*) peoples, our salt flat means life itself’ (cit. in Aranda, 2018).

This contrasting territorial vision in turn brings a more expansive assessment of costs. As Sandra Flores, a resident of the Atacaman community of Coyo observes, ‘[to exploit lithium] is to finish with a part of humanity . . . [It is] to extinguish a culture, kill it. It has taken

huge efforts to live in this desert, it's difficult, it's not easy, and...we've been able to conserve [this culture] over the course of many years' (cit. in Martín-Cabrera, 2018). Slogans and statements recurrent across anti-extractive movements in the Triangle – 'Water is worth more than lithium' or 'We don't eat batteries' – depict fundamental differences in 'languages of valuation' (Martinez-Alier, 2009).

Finally, counter-discourses in the Triangle also repeatedly disavow the imagery of clean, high-tech futures posed by hegemonic lithium discourses, emphasising lithium as another step in a 'business as usual' trajectory of extractivism, indifferent to its implications. As Ramón Morales Balcázar, a representative of the Defend the Salt Flat movement in Chile, comments: 'The great North [the northernmost region of Chile, comprising the Atacama desert] has historically been considered as a zone of sacrifice, which has affected Indigenous communities for over one hundred years, first with saltpetre, then copper and lithium' (cit. in El Mostrador, 2017). As researcher Jaime Aleé from the University of Chile's Centre for Innovation of Lithium also noted '[t]he possession of lithium reserves has become a post-truth. It's associated with a "bypass" to a techno-industrial world that has no basis in reality' (cit. in Estepa, 2017).

Resource governance and discourse in an era of 'green extractivism'

In this article, we have argued that the ways in which lithium is discursively framed play a central role in governing its extraction. The discourses and imaginaries identified in the analysis serve to symbolically underwrite the expansion of lithium extractive frontiers. As it has long been the case with the extraction of minerals and hydrocarbons, institutional actors and firms promoting 'resource-based accumulation' seek to frame it as a vehicle for development and national emancipation. Additionally, however, lithium projects in the Triangle are distinguished by the visibility of discourses associating them with inclusive, prosperous, zero-carbon and post-petroleum futures. These discourses seek to attract investment, gain popular support and attain the consent of affected populations, crucial at a time of high scrutiny of mining in the region and of growing expectations around the lithium industry.

Discourse and the governance of lithium

Our analysis has allowed us to contribute to conversations about how mining and extraction are stabilised and regularised. We hope to have shown that discourses and imaginaries matter to environmental governance. This is not to say, of course, that resource regulation can be reduced to its discursive 'moment'. Material rewards (including rent redistribution, job creation and a host of local 'development' projects), formal and informal participatory and co-optation mechanisms, and the ever-present threat of repression and violence have all been shown by political ecologists to contribute to obtaining the active or passive consent of affected populations around extractive projects. At the same time – especially with regard to an industry associated with wildly exaggerated expectations and potent 'socio-technical' and 'national' imaginaries – discourse has emerged as a central governance mechanism for political leaders in the Triangle, aiming to naturalise the association of lithium exploitation with inclusive and modernising development, all the while displacing or invisibilising the ecological contradictions of a climate-friendly extractivism.

Our findings reinforce previous research into the role of discourse in resource governance, specifically with regard to the appropriation of 'sustainability' and associated environmental narratives by extractive firms (Bridge and McManus, 2000). However, the findings also suggest the emergence of new dynamics, with imaginaries of techno-renewable futures influencing

the discursive repertoire of institutional actors promoting lithium development. Climate change discourses, specifically, are likely to be increasingly prominent factors in the governance of extractive regimes, whether linked to lithium or to other ‘high-tech minerals’.

Lithium regimes, and the discourses that sustain them, signal the emergence of what can be termed ‘green extractivism’ (Dunlap and Jacobsen, 2020; Riofrancos, 2019).⁵ Green extractivism represents a new phase in the complex relationship between mining and the environment, whereby extraction and valorisation of mineral resources is rendered not only compatible with ‘sustainable development’, but *necessary* to it and the possibility of a ‘low-carbon’ future. Lithium embodies the fantasy of a ‘technological fix’, capable of turning the climate crisis into a political and economic opportunity for those in power (Moore et al., 2018; Wainwright and Mann, 2015), by displacing and rendering invisible the outfall of ecological disaster. From the periphery, this fantasy is coupled with imaginaries of national development and affirmation, and the possibility of redeeming a dark past of dirty extraction and of foreign plunder of local wealth, by inaugurating a form of extraction capable of generating high tech industries and ‘green jobs’.

Environmental discourses are closely intertwined with pre-existing and novel development imaginaries. The discourse of ‘ecological extraction’ in the Lithium Triangle is one where imaginaries are reconciled, coupling the ‘green’ to the ‘national’ to the ‘high-tech’ and ‘prosperous’. Lithium is an emblem of a desirable and highly-possible ecological modernisation, and the dream of greater national power. After years of serious public challenges to extractivism, lithium offers the contours of a revitalised discursive project, which positions mining as clean, innocuous, future-oriented and modern. Old imaginaries of resource nationalism, gushing extractive wealth and rational exploitation are rephrased and renewed by the appeal of clean technologies, and the urgency of climate change.

Lithium mining and climate change

Our analysis contributes to ongoing discussions in geography and political ecology on the relationship between mining and climate change, shedding light on how climate change mitigation efforts may be a driver of extractive frontier expansion. Previous research on mining and climate change has documented how socio-ecological and climatic concerns may push states to restrict mining opportunities (Broad and Cavanagh, 2015). Climate change has been identified as a ‘driver of mining policy’, particularly in water-scarce environments, stimulating prohibitions on metallic mining given political concerns around the vulnerability of water resources (Odell et al., 2018). Yet, this case study suggests the emergence of an inverse relation: climate change may in fact contribute to the expansion of extractive frontiers, even in water-scarce environments.

Climate change shapes mining activity not just through directly affecting production processes (Rüttinger and Sharma, 2016), but also by shaping the discursive repertoire of extraction regimes, the politico-economic drivers of extraction and public perceptions of mining. The geo-physical consequences of climate change may not just enable access to mining operations that were previously inaccessible, but also discursively enable mining operations whose legitimisation was previously complicated (Odell et al., 2018), through shaping imaginaries of ‘green’ extraction and desirable development.

The analysis presented in this article also points to a contradiction between mining processes linked to mitigation technologies and the global policy goal of reducing climatic ‘vulnerability’. As the transition away from fossil fuels gains hold, the growing demand for transitional materials is reshaping territories such as the salt flats of Argentina, Bolivia and Chile. This case study hints to a troubling paradox for communities facing the ‘double

exposure' of vulnerability to climate change and economic processes linked to the responses to climate change (Leichenko and O'Brien, 2008). As climate-fuelled water scarcities increasingly affect communities in the area of the Triangle, the mining deemed necessary for climate mitigation becomes a clear threat to climate change adaptation, for it makes claims on water resources crucial to rural populations facing climate change. The Lithium Triangle thus directly elucidates the tensions between the material demands of an intensive transition to a high-consumption, post-fossil economy and its consequences for territories and communities (Göbel, 2013).

Conclusions

This article has laid out the main discursive strategies used to validate and legitimise lithium exploitation in the Triangle, and how they draw on and seek to shape imaginaries of modernising development, resource nationalism and environmental benignity. It has contributed an early sketch of how discursive strategies are being adjusted in a context of accelerating climate change and an ongoing economic-technological shift towards 'low carbon' production, and argued that such strategies are likely to play a central role in the governance of lithium and other transition minerals. Discourses of 'green' and 'climate-friendly' extraction are emerging to sanction lithium projects' expansion and obscure their socio-environmental costs and burdens; not least, the way they contribute to dispossessing local indigenous and *campesino* populations by accumulating large quantities of water (cf. Perreault, 2013).

The concept of 'green extractivism' put forward in this paper is meant to signal the fantasy of an environmentally and climatically benign resource frontier, of an ultimate technological and ecological fix capable of fuelling local and national development while saving global capital from its own ecological contradictions. We hope that this concept, and our analysis more broadly, may contribute to ongoing conversations on the contradictory character of climate change mitigation strategies that rely on intensive mineral extraction.

Highlights

- The lithium extractive frontier is expanding, driven partly by technological and economic shifts associated with climate mitigation goals.
- Lithium mining in the 'Lithium Triangle' region is linked to a range of socio-ecological conflicts.
- Institutional actors seek to obscure the costs of mining by deploying discursive strategies associating mining with climate action and 'high-tech industries'.
- Such dynamics suggest an emergent era of 'green extractivism', whereby intensive resource exploitation is framed not only as compatible with climate change, but indeed as *necessary* to its mitigation.

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Notes

1. We have chosen to use the term 'transition minerals' throughout the text, as it most clearly makes a link between materials and the low-carbon transition, a key focus of this paper.
2. Citations from Spanish-language documents are translated by the authors.
3. Comparative cost estimates show that brine-based lithium extraction is far cheaper than hard-rock mining (Desjardins, 2015). These benefits can be understood through brine lithium's three-step production process: extraction, concentration and purification. Salt flat brines are underground reservoirs containing liquids with high concentrations of dissolved elements, such as lithium or potassium. These brines are pumped to the surface and placed in ponds; exposed to solar heat, water evaporates, increasing the density of minerals in the solution. These solutions are then taken to processing facilities, where they are purified into crystals of lithium carbonate and lithium hydroxide, to be then used in the production of batteries or other industrial products (Meshram et al., 2014).
4. The proximities and inter-linkages between state and financial discourses echoes the work of scholars suggesting that discursive strategies in extraction reflect the performativity of capital in the economy of spectacles and appearances (Tsing, 2000). In the market conditions of extractive industries, riven by elastic demand and volatile prices, perception and commodity confidence are crucial for attracting investors, maintaining high returns and ensuring the feasibility of projects.
5. This notion bears similarities to that of 'green grabbing' (Fairhead et al., 2012), defined as the appropriation of nature for environmental ends. It is also linked to 'eco-colonialism', used to refer to extractive regimes that valorise peripheral terrains as zones of environmental value (Núñez et al., 2019).

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