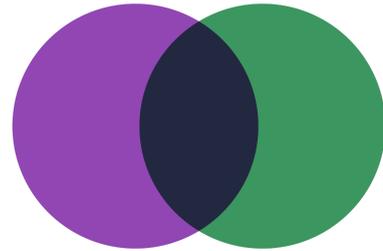




DIAGRAMMOS

Thea RIOFRANCOS



EXTRACTIVISM, GREEN AND BROWN

Prolog

In January 2025, Donald Trump began his second term in office by declaring an “energy emergency.” Behind this dramatic gesture lies a two-pronged strategy. On the one hand, the order of the day is “drill, baby drill”: the new plan involves a massive relaunch of fossil fuel production, the doubling of liquefied natural gas exports, and the dismantling of policies supporting electric vehicles. But on the other hand, the Republican administration is intent on securing U.S. access to the critical minerals upon which the global energy transition depends. Even before trade tensions with Beijing escalated, Trump had made public his ambition to overtake China as the world’s leading producer of lithium.

Should this new course be understood as a break with the orientation of the previous administration? In some respects, yes: Joe Biden did project the image of a green industrial turn through large-scale investment in renewable infrastructure. Yet he also issued a record number of oil and gas extraction permits. What truly distinguishes Donald Trump from his predecessor, therefore, is the emphatic disregard for any ecological pretense in his administration’s twofold claim on old and new energy sources.

To make sense of the transformations and stakes involved in the energy strategies pursued not only by states, but also by corporations and social movements, Thea Riofrancos explores the interlinkages between geoeconomics, extractive endeavors, and climate policy. A political scientist, environmental activist, and researcher at the Climate and Community Project, she has been tracking the evolution of extractivism for over a decade. Her forthcoming book, *Extraction: The Frontiers of Green Capitalism*, extends a research project that began in Latin America. What she focuses on is the relocation of extractive industries to the Global North, driven by the imperatives of decarbonization.

For Riofrancos, extractivism is not merely a localized operation of resource removal; it constitutes an enduring political and economic regime, historically shaped by unequal exchange between industrial centers and exporting peripheries, as well as by the systematic externalization of social and environmental costs. Thus, the concept of *green extractivism* does not denote a rupture, but a mutation of the extractive regime. It encompasses both the intensification of mining driven by low-carbon technologies and infrastructures, and the environmental alibi invoked by extractive industries—regardless of the end use of the resources extracted.

What Riofrancos calls the *security–sustainability nexus* designates the growing fusion of climate objectives, industrial imperatives, and geopolitical rationales. It signals a new phase of green capitalism in which the failure of market-based mechanisms prompts states to support private investment—through guarantees, subsidies, and incentives for domestic reindustrialization. Riofrancos sets out to analyze the various tensions that emerge within this new geography of decarbonization: inter-state rivalries, competing priorities between national security and the demands of financial capital, and internal conflicts between the fossil and renewable energy fractions of industrial capital.

She also seeks to illuminate the current geoeconomic configuration in light of four major historical inflection points: the energy crisis of the 1970s, marked by the simultaneous rise of resource nationalism in the Global South and energy security discourse in the Global North; the commodity boom and the rise of China following the 2008 financial crisis; the protectionist turn inaugurated by Trump's first presidency in 2016; and, finally, the green industrialism of the Biden administration.

Our conversation with Thea Riofrancos addressed the two sides of her work: we invited the political scientist to reflect on the long arc of her research, but also asked the activist to revisit her contribution to the 2023 report entitled *More Mobility, Less Mining* in order to reflect on the various strategies deployed to resist extractivism—whether brown or green.

The interview took place in New York on March 14, 2025.

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Chapter 1

What is Extractivism?

From Economic to Ecological Unequal Exchange

Economic unequal exchange refers to a systematic imbalance in the terms of trade that enables wealth and surplus value to flow from less-developed “peripheral” nations to industrialized “core” nations. Originating as a critique of classical free-trade theory, where comparative advantage is regarded as a win-win situation, the concept was advanced by Marxist and dependency scholars who argued that global market prices reflect underlying power inequalities rather than genuine equivalence. The theory was first foregrounded by German-American dependency theorist Andre Gunder Frank,¹ but it was French-Greek economist Arghiri Emmanuel who formally developed the concept.² Emmanuel demonstrated that even under conditions of equal productivity, significantly lower wages in developing countries cause their exports to be undervalued relative to those of developed countries, resulting in a net transfer of surplus labor value to the rich world. In such exchanges, peripheral economies effectively sell goods below their real value and purchase imports above their value, allowing advanced countries to appropriate more labor time than they expend—the periphery loses value while the core gains. World-systems theorists, notably Immanuel Wallerstein, later identified unequal exchange as a structural mechanism of global capitalism: a built-in core-periphery dynamic whereby resources and value continuously siphon from the periphery to enrich the core.³ These interpretations—Marxist, dependency, and world-systems—collectively underscore unequal exchange as a driver of persistent underdevelopment and global inequality, in stark contrast to neoclassical models that assume mutual gains from trade.

¹ Andre Gunder Frank, *Capitalism and Underdevelopment in Latin America: Historical Studies of Chile and Brazil* (New York: Monthly Review Press, 1967).

² Arghiri Emmanuel, *Unequal Exchange: A Study of the Imperialism of Trade*, trans. Brian Pearce (New York: Monthly Review Press, 1972).

³ Immanuel Wallerstein, *The Modern World-System, Vol. I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century* (New York: Academic Press, 1974); see also *World-Systems Analysis: An Introduction* (Durham: Duke University Press, 2004).

Ecological unequal exchange extends this critique of trade imbalance into the domain of biophysical transfers, arguing that global economic structures systematically facilitate the net appropriation of energy, materials, and environmental capacity from the Global South to the Global North. Scholars in ecological economics, political ecology, and environmental sociology argue that the international division of labor not only reproduces economic hierarchies but also enables wealthier countries to externalize environmental degradation to poorer nations. This perspective seeks to highlight that traded goods do not embody the same “ecological value,” understood as the quantity of matter or land area required for their production.

The concept of ecological unequal exchange builds upon the Marxian notion of a *metabolic rift*, pointing to the ways capitalist systems rupture the ecological relations necessary for sustainable reproduction.⁴ Foster and Holleman elaborate a Marx–Odum synthesis to theorize the biophysical costs embedded in global trade.⁵ Comparative–historical sociologists have further documented how these asymmetric biophysical flows are historically rooted and structurally maintained.⁶ Empirical studies confirm that high-income nations sustain material-intensive consumption patterns by importing resource-intensive goods and exporting waste, thereby reinforcing global ecological injustice.⁷ These analyses underpin growing calls for the recognition of a historical ecological debt owed by the Global North for its disproportionate appropriation of global environmental space.

In *The Great Divergence*, historian Kenneth Pomeranz demonstrates that England’s 19th-century industrial development was made possible through the importation of resources from its colonies. By calculating the land area required to produce imported goods (sugar, timber, livestock, cotton) in 1830, he estimates that Britain effectively benefited from 10 million “ghost acres” that sustained its industrial economy.⁸ In a similar vein, Alf Hornborg showed that in 1850, the exchange of 1,000 pounds of Manchester-manufactured textiles for 1,000 pounds of

⁴ John Bellamy Foster, “Marx’s Theory of Metabolic Rift: Classical Foundations for Environmental Sociology,” *Monthly Review* 50, no. 3 (1999).

⁵ John Bellamy Foster and Hannah Holleman, “The Theory of Unequal Ecological Exchange: A Marx–Odum Dialectic,” *The Journal of Peasant Studies* 41, no. 2 (2014): 199–226.

⁶ R. Scott Frey, Paul K. Gellert, and Harry F. Dahms (eds.), *Ecologically Unequal Exchange: Environmental Injustice in Comparative and Historical Perspective* (Cham: Palgrave Macmillan, 2019).

⁷ Alf Hornborg and Joan Martinez-Alier, “Ecologically Unequal Exchange and Ecological Debt,” *Journal of Political Ecology* 23, no. 1 (2016): 328–333; R. Muradian, M. Walter, and J. Martinez-Alier, “Hegemonic Transitions and Global Shifts in Social Metabolism: Implications for Resource-Rich Countries,” *Ecological Economics* 81 (2012): 1–7; Christian Dorninger et al., “Global Patterns of Ecologically Unequal Exchange: Implications for Sustainability in the 21st Century,” *Nature Sustainability* 4 (2021): 634–642.

⁸ Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2010).

American cotton represented a gain of 46% in embodied labor time (economic unequal exchange), and 6,000% in terms of embodied land area (ecological unequal exchange).⁹

⁹ Alf Hornborg, *Global Ecology and Unequal Exchange: Fetishism in a Technological World* (New York: Routledge, 2011), esp. pp. 85–91.

Ore, Rare Earth Elements, and Critical Minerals

It is essential to distinguish between the notions of *ore*, *rare earth elements*, and *critical minerals*, both in terms of their material reality and their normative dimension.

An *ore* refers to a rock or a natural assemblage of minerals containing concentrations of elements that are economically exploitable. It is from these natural resources that metals and mineral substances are extracted through mining and metallurgical processes¹⁰. The concept of ore is primarily used in the geosciences and the extractive industry; it is fundamentally descriptive and geological, without direct political implications, although certain extracted resources may later acquire strategic significance.

Rare earth elements constitute a specific subset of mineral resources extracted from ores. This group comprises seventeen chemical elements characterized by unique physical and electronic properties. Their use is critical in high-technology sectors, such as permanent magnets, metallic alloys, and electronic devices¹¹. Historically, from the 1960s through the 1990s, the United States was the leading global producer, thanks to the Mountain Pass mine in California. However, since the early 2000s, China has emerged as the primary supplier, currently accounting for over 70% of world production¹². This monopolization has raised concerns not only about supply chain vulnerability but also about the significant ecological damage associated with extraction and refining practices in China. These include widespread soil and water contamination from chemical leaching, poorly managed waste, and serious public health consequences in mining regions. In response to both internal and external pressures, the Chinese government began to restrict production and exports in the early 2010s, using quotas to assert geopolitical leverage—at one point even suspending exports to Japan amid a territorial dispute. This episode triggered alarm in international markets and spurred renewed interest in securing alternative supplies¹³.

Critical minerals, by contrast, are defined through political and institutional frameworks. They refer to materials considered essential for economic activity and particularly for the energy transition, while also being exposed to potential supply disruptions¹⁴. This designation is not based on geophysical scarcity alone, but on the strategic role assigned to these materials in

¹⁰ Bureau de Recherches Géologiques et Minières (BRGM), [Glossaire de géologie](#); United States Geological Survey (USGS), [Mineral Resources Program](#). ↩

¹¹ International Union of Pure and Applied Chemistry (IUPAC), *Nomenclature of Inorganic Chemistry: IUPAC Recommendations 2005*; USGS, [Rare Earths Statistics and Information](#). ↩

¹² Thea Riofrancos, *Extraction: The Frontiers of Green Capitalism* (New York: W.W. Norton, 2023), 132. ↩

¹³ *Ibid.*, 132–133. ↩

¹⁴ European Commission, [Proposal for a Regulation on Critical Raw Materials](#) (*Critical Raw Materials Act*), March 2023; USGS, 2022 [List of Critical Minerals](#). ↩

national or regional policies. The classification reflects broader geopolitical priorities and helps shape industrial, commercial, and diplomatic agendas. The reassessment of mineral dependency in the Global North—especially following the 2010 supply chain shocks—led to the formalization of critical minerals strategies in the United States and the European Union. Notably, although lithium was initially absent from early criticality lists, U.S. authorities soon projected its rising importance for battery technologies and energy storage. Its subsequent designation as a critical mineral confirms how these classifications respond to evolving economic and technological imperatives rather than absolute material scarcity¹⁵.

¹⁵ Riofrancos, *Extraction*, 133. ↩

Chapter 2

Green and brown mining

The Colonial Extraction Regime of Potosí

The Cerro Rico of Potosí, located in the Andean highlands of present-day Bolivia, stands as a paradigmatic site of colonial extractivism in the early modern world. Discovered in 1545—according to legend, when an Indigenous man's fire revealed silver melting from the rocks—the mountain quickly became a linchpin in the Spanish Empire's imperial circuits. Under Philip II, Potosí was granted imperial city status and soon became the largest urban center in the Americas; by the early 18th century, its population had reached 150,000.

The extraordinary output of the Cerro Rico—estimated to have supplied over half the world's silver in the 16th and 17th centuries—made it central not only to the Spanish imperial economy but to the emergence of a global capitalist system, notably through trade with Ming China via the Manila Galleon. The silver of Potosí financed Spain's expansive European ambitions while fueling the circulation of wealth across the Atlantic and Pacific worlds.

This accumulation of imperial wealth rested on a coercive and extractive labor regime. The Spanish adapted the Inca *mita* system into a colonial institution of forced labor, compelling thousands of Indigenous men from across the Andean highlands to work in brutal and often lethal conditions. Mercury amalgamation, introduced in the late 16th century to process lower-grade silver ore, not only intensified production but also caused devastating environmental pollution and mercury poisoning among local populations.¹⁶

At the same time, Potosí's wealth shaped the urban and infrastructural landscape: networks of aqueducts, artificial lakes, and mule trails connected the city to the wider colonial economy, linking the silver mountain to ports from Lima to the Río de la Plata. The phrase "worth a Potosí"

¹⁶ Nicholas A. Robins, *Mercury, Mining, and Empire: The Human and Ecological Cost of Colonial Silver Mining in the Andes* (Bloomington: Indiana University Press, 2011).

came to symbolize the mine's fabled riches, even as its human cost was staggering—a "sacrifice zone" immortalized by Eduardo Galeano as one of the "open veins" of Latin America.¹⁷

By the 18th century, the richest seams of silver were exhausted, leading to a decline in production. Mining activity slowed further until a late 19th-century revival focused on tin extraction. After the Bolivian Revolution of 1952, the mines were nationalized, only to face closures in the 1990s; some were later reopened as cooperatives, with thousands of miners still extracting silver, tin, and zinc today.¹⁸

In 1987, UNESCO designated Potosí a World Heritage Site, recognizing not only its colonial cityscape but also its mines, aqueducts, and workers' quarters (*barrios mitayos*). Tourism has since become a significant part of the local economy, with mining cooperatives offering tours into the mountain's depths. Yet the legacy of Potosí endures as a stark emblem of the violent entanglement of labor exploitation, environmental extraction, and colonial world-making at the foundations of modern global capitalism.

¹⁷ Eduardo Galeano, *Open Veins of Latin America: Five Centuries of the Pillage of a Continent* (New York: Monthly Review Press, 1997 [orig. 1971]).

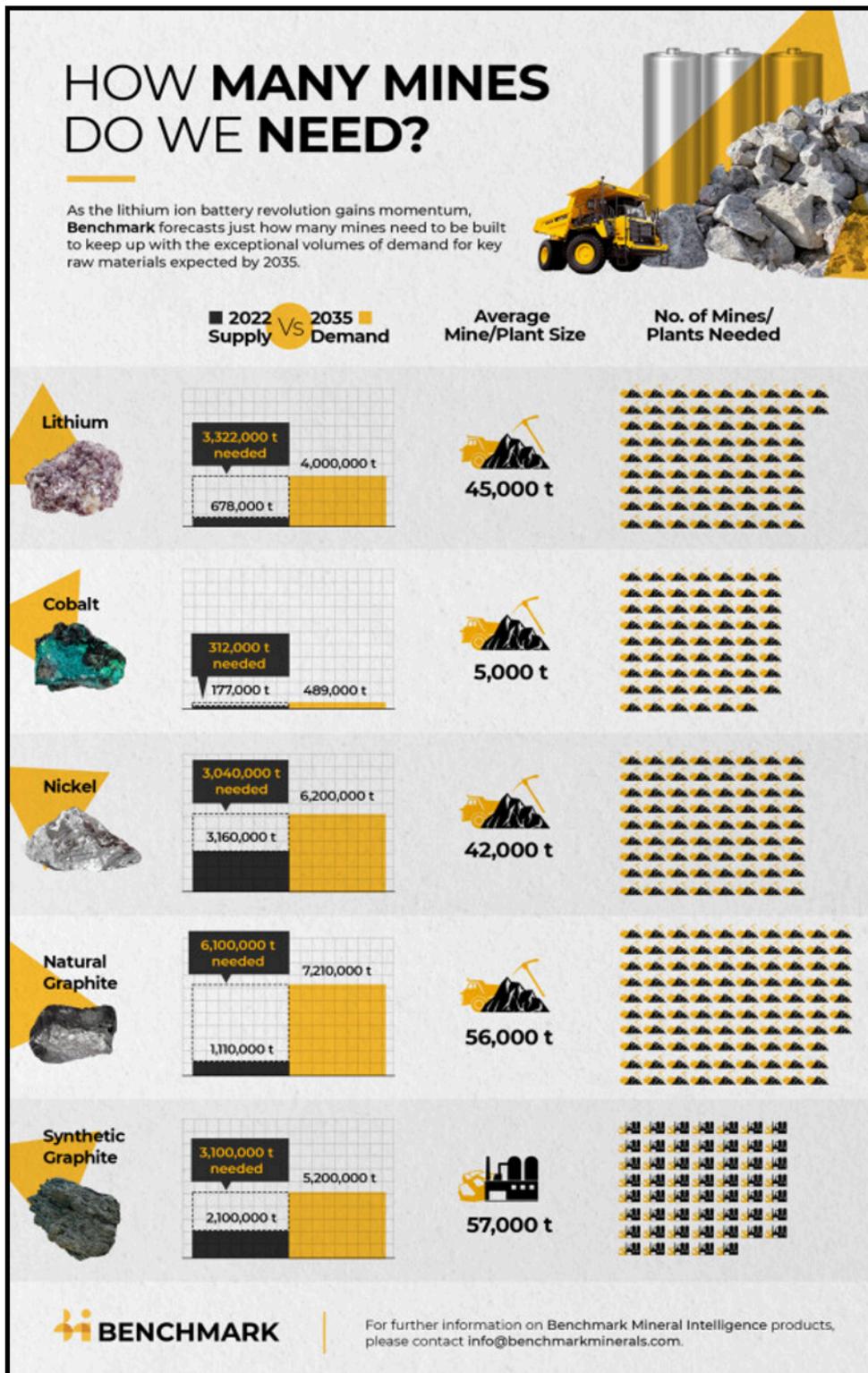
¹⁸ "[Potosí](#)," Encyclopædia Universalis.

Indigenous Labor in the Potosí mine



Engraving by Theodor de Bry (1590) depicting Indigenous workers in a mine in Potosí, New Spain (present-day Bolivia). This site was one of the most important silver extraction centers of the Spanish colonial system, relying on the forced labor of Andean populations.

384 New Mines



According to estimates by Benchmark Mineral Intelligence, 384 new mines will need to be operational by 2025 in order to meet the anticipated demand for metals used in electric battery production.

Chapter 3

The security–sustainability nexus

James O'Connor's Second Contradiction

On the eve of the collapse of the Eastern Bloc, ecological Marxism entered its first phase of institutionalization, establishing itself as an autonomous field of research.¹⁹ In 1988—the same year the Intergovernmental Panel on Climate Change (IPCC) was founded—the first explicitly eco-Marxist journal, *Capitalism, Nature, Socialism* (CNS), was launched by economists Barbara Laurence and James R. O'Connor (1930–2017). A professor of sociology at the University of California, Santa Cruz, O'Connor became a foundational figure in ecological Marxist thought. The journal emerged in reaction to what its founders viewed as the limitations of dominant ecological currents of the 1970s: “bourgeois naturalists, the Club of Rome, Malthusians, Deep Ecology, or UN-style globalism.” These approaches, they argued, “ignored or distorted Marx’s analyses of the historical forms of nature, as well as of capitalist accumulation and development.”²⁰

In contrast, James O'Connor—alongside contemporaneous work by Kate Soper and Ted Benton in the United Kingdom—proposed a distinctive reinterpretation of Marxism, an effort toward the “greening of Marxism.” In the context of the post-1973 oil shock recession, O'Connor developed what he termed the theory of capitalism’s “second contradiction.” According to this theory, the *underproduction of nature*—caused by environmental degradation—leads to rising production costs, thereby undermining capital accumulation. As O'Connor explained, “capital’s use and abuse of nature” progressively impairs valorization, necessitating growing state intervention as an “interface between capital and nature”:

“The warming of the atmosphere will inevitably destroy people, places, and profits, not to speak of other species life. Acid rain destroys forests and lakes and buildings

¹⁹ Bickhardt, Marius, and Cannelle Gignoux, “[Le marxisme écologique en contexte\(s\). Une histoire en cinq épisodes](#)”, *Critique*, forthcoming June 2025.

²⁰ James O'Connor, “Capitalism, Nature, Socialism: A Theoretical Introduction,” *Capitalism, Nature, Socialism* 1, no. 1 (1988): 11.

and profits alike. Salinization of water tables, toxic wastes, soil erosion, etc. impair nature and profitability. The pesticide treadmill destroys profits as well as nature.”²¹

The theory later developed by historian Jason W. Moore on the *tendential decline of the ecological surplus*—linked to the exhaustion of the “unpaid work” performed by women, colonies, and historical natures (energy, raw materials)—attests to the enduring influence of O’Connor’s framework.²²

This new theory of crisis was accompanied by a reconfiguration of the model of social conflict. Whereas the “first contradiction” of classical Marxism centered on the antagonism between capital and labor, the “second contradiction” articulated by ecological Marxism offers a theoretical lens to understand emerging social movements. One pivotal moment in this politicization was the 1982 mobilization in Warren County, North Carolina, against the siting of a toxic waste landfill in a predominantly African American community—an event widely regarded as the birth of the environmental justice movement. This form of struggle shifted the center of gravity of conflict from the sphere of production to that of social reproduction, a transformation that O’Connor’s theory helps to conceptualize.

²¹ James O’Connor, *Natural Causes: Essays in Ecological Marxism* (New York: Guilford Press, 1998), 158.

²² Jason W. Moore, *Capitalism in the Web of Life: Ecology and the Accumulation of Capital* (London: Verso, 2015), esp. ch. 4.

Two Phases of Green Capitalism

The evolution of green capitalism can be analytically distinguished into two phases, each characterized by a distinct configuration of state–market relations, regulatory paradigms, and political rationalities.

The first phase emerged in the late 20th and early 21st centuries, underpinned by the rise of environmental economics and a growing recognition of the imperative to internalize so-called *ecological externalities*. This framework conceptualized environmental degradation not as a structural consequence of capitalist accumulation, but as a market failure amenable to correction through economic instruments. The *Stern Review* (2006) crystallized this discourse by famously describing climate change as “the greatest market failure the world has ever seen.”²³ Policy responses during this phase prioritized market-based mechanisms—including carbon pricing, environmental taxation, and cap-and-trade systems—intended to align market signals with ecological objectives. The role of the state was largely confined to that of a *meta-regulator*, responsible for establishing the institutional preconditions for “undistorted” market competition by internalizing externalities, without fundamentally altering the market’s allocative logics or ownership structures.

By contrast, the second phase of green capitalism has been shaped by a shifting geopolitical and economic context: notably the rise of China as an industrial and technological power, the cascading disruptions to global supply chains precipitated by the COVID-19 pandemic, and the intensification of geopolitical rivalries following the Russian invasion of Ukraine. In this conjuncture, states have moved beyond horizontal regulatory interventions toward the deployment of *vertical industrial policies*, directly steering investment, production, and innovation in strategic sectors such as renewable energy, electric mobility, and critical raw materials. This transformation marks a shift from the “regulatory state” of the first phase to a *developmental state* that actively engages in market-shaping to secure geopolitical advantage and economic resilience. This new paradigm is exemplified by China’s vision of an “ecological civilization,” the United States’ green industrial strategy—manifested in the Inflation Reduction Act—and the European Union’s pursuit of “strategic autonomy” in renewable energy and battery supply chains.²⁴

²³ Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press, 2006), xxvi.

²⁴ On “ecological civilization,” see Pan Jiahua, “Ecological Civilization: A New Development Paradigm,” *China Economist* 8, no. 3 (2013); on the Inflation Reduction Act and EU strategic autonomy, see European Commission, *Updating the 2020 New Industrial Strategy* (2021); and Leah Stokes and Sam Ricketts, *The Inflation Reduction Act: A Guide* (Evergreen Action, 2022).

However, this trajectory of *green modernization* should not be mistaken for a rupture with fossil capitalism. Rather, it represents a *green–brown hybrid* formation, characterized by the structural co-dependence between the expansion of renewable energy systems and the persistence, or even extension, of fossil fuel infrastructures. This dynamic is exemplified by the integration of carbon removal technologies—now positioned as indispensable components of net-zero transition pathways—which facilitate the continued valorization of fossil assets under a framework of deferred decarbonization.²⁵ Crucially, such technologies are being underwritten by state-led *de-risking* mechanisms, as illustrated by the Inflation Reduction Act’s provision of public guarantees, subsidies, and incentives to private capital.

In this light, the era of *greenwashing*—centered on corporate disclosures, consumer behavioral nudging, and the privatization of responsibility through carbon footprints—appears to be giving way to a more materially grounded phase of green capitalism, structured by large-scale investment, state coordination, and intensifying geopolitical rivalry. A paradigmatic example of this earlier phase of greenwashing and nudging was BP’s introduction of a “carbon footprint calculator” in 2004, which individualized responsibility for emissions and deflected attention from the systemic drivers of fossil fuel dependency.²⁶

Yet this emergent phase remains fragile and contested. The resurgence of fossil capital, as evidenced by the regulatory rollbacks pursued under Trumpist politics, underscores the enduring political power of carbon-intensive industries. Moreover, the European backlash against climate policy—manifested in agricultural protests and the March 2023 agreement with Germany to allow the continued sale of new combustion-engine vehicles after 2035—signals that the ecological modernization of capitalism may already be encountering limits and entering a new phase of crisis and decline.²⁷

²⁵ See Holly Jean Buck, *After Geoengineering: Climate Tragedy, Repair, and Restoration* (London: Verso, 2019), esp. ch. 3.

²⁶ Melissa Aronczyk and Maria I. Espinoza, “The Ideology of the Carbon Footprint,” *Environmental Communication* 14, no. 1 (2020): 1–14.

²⁷ “[Conference Report: Green Capitalism](#),” Critical Theory in Berlin, November 2024.

Strategic Autonomy in the European Union

In recent years, *strategic autonomy* has become a central concept in EU policy and academic debates. It refers to the European Union's ability to act independently in critical domains—such as defense, energy, technology, and industry—without excessive reliance on external powers. While the term first emerged in defense circles after the Kosovo War (1999), it has since broadened to encompass economic resilience, technological sovereignty, and supply chain security.²⁸

This evolution accelerated after 2016, when the EU Global Strategy reframed autonomy as a multidimensional goal. Geopolitical tensions—exacerbated by Brexit, the Trump presidency, the COVID-19 pandemic, and the war in Ukraine—highlighted Europe's external dependencies in sectors like pharmaceuticals, semiconductors, and raw materials. The European Commission now explicitly links strategic autonomy to the ability to secure key technologies and critical infrastructure, particularly in energy, digital systems, and green industries²⁹.

A key strategy in this pursuit is *onshoring*: relocating or developing production capacities within EU borders. Lithium, essential to battery manufacturing and the green transition, has become emblematic of this effort. Onshoring lithium production is presented not only as a decarbonization strategy, but also as a response to geopolitical risks—shielding Europe from unstable supply chains and foreign dominance.

This orientation signals a broader *geo-economic turn*, where supply chains are redefined as strategic assets. In this context, the EU has mobilized substantial public and private investment to build a vertically integrated battery sector—from mining and processing to manufacturing and recycling. The EU Battery Alliance, launched in 2017, exemplifies this industrial coordination, with Horizon Europe and national programs funding projects across the continent.

The resurgence of industrial policy underpins this shift. Long dismissed under the free-market logic of neoliberalism, state-led planning is now redeployed to foster strategic sectors, drive innovation, and secure resource autonomy. Instruments include public subsidies, tax incentives, direct investment, and regulatory streamlining.

Yet tensions remain. Despite the ambition for autonomy, many leading firms in Europe's battery supply chain are foreign-owned—particularly by Chinese companies like CATL. These structural

²⁸ Daniel Fiott, [Strategic Autonomy: Towards 'European Sovereignty' in Defence?](#), European Union Institute for Security Studies, 2018.

²⁹ European Commission, [Updating the 2020 New Industrial Strategy: Building a Stronger Single Market for Europe's Recovery](#), 2021.

dependencies challenge the feasibility of full sovereignty within globalized markets. Moreover, with the onset of Trump 2.0 and the erosion of transatlantic security guarantees, the EU's strategic autonomy is entering a new phase—one increasingly marked by rearmament and militarization.

Onshoring, Reshoring, Friendshoring

Onshoring, reshoring, and friendshoring represent three distinct yet complementary strategies for reorganizing supply chains.

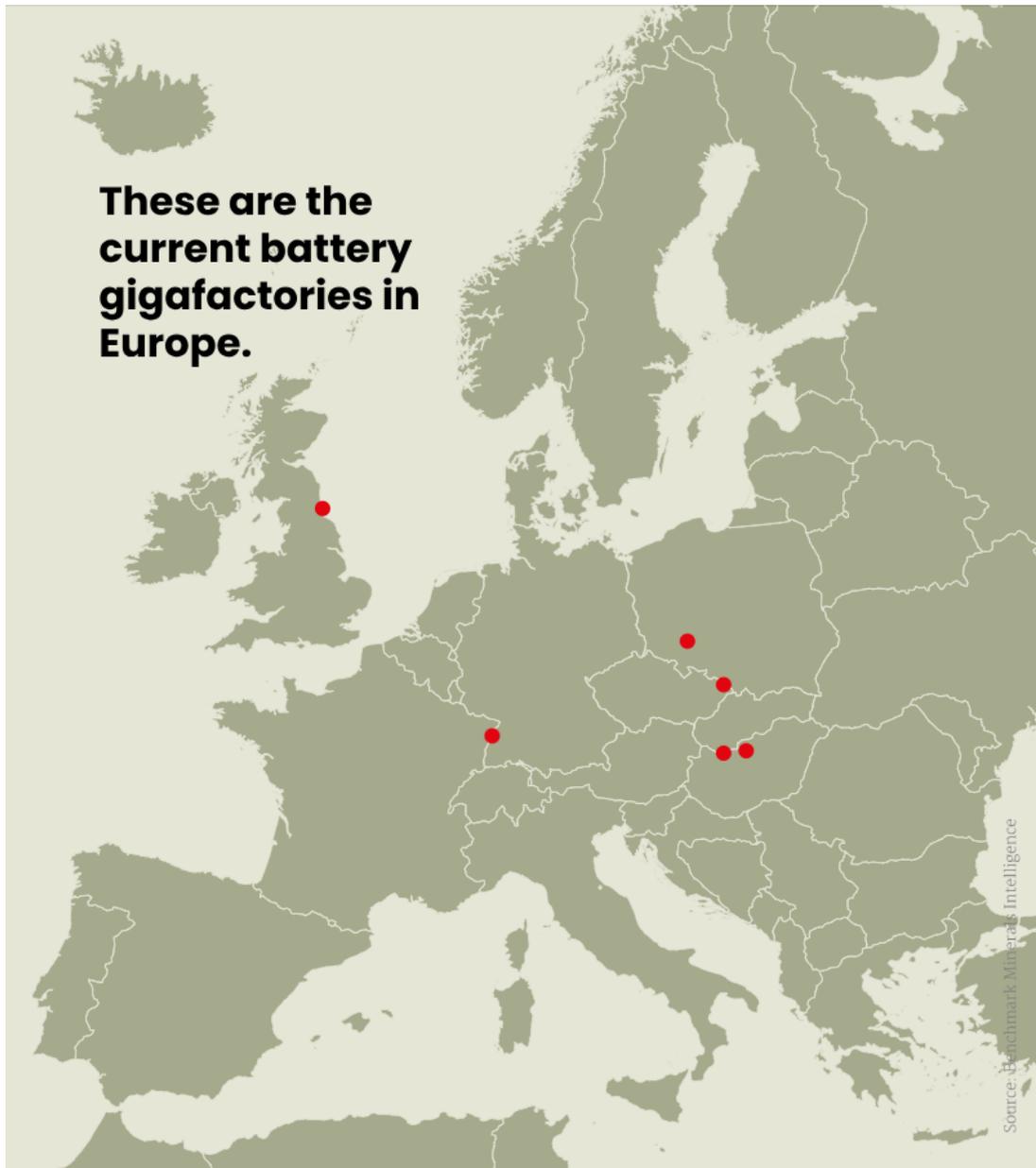
Onshoring refers to the relocation of production or business operations from foreign countries back to the domestic territory of a firm or state. This process seeks to reduce reliance on international supply chains, enhance domestic control over critical industries, and mitigate vulnerabilities exposed by global disruptions or geopolitical tensions. Onshoring is often promoted through national industrial policies aimed at strengthening local manufacturing capacity and securing key sectors within national borders. For instance, the United States' recent investments in domestic semiconductor manufacturing—exemplified by Intel's new fabrication plants in Arizona—represent a clear case of onshoring designed to reduce dependence on foreign chip producers. Onshoring lithium production has become a particularly salient trend in Europe, where it embodies a policy fusion of environmental sustainability, economic competitiveness, and geopolitical security. Even before the COVID-19 pandemic and the Russian invasion of Ukraine disrupted global trade and supply chains, the rise of China and the looming threat of climate change had already prompted contemporary discourses around "supply chain security." The U.S. government has since followed Europe's lead by incentivizing private investment in new lithium mines and battery factories.

Reshoring, while closely related, refers more specifically to the repatriation of previously offshored or outsourced production activities. It is more prominent in the American context than in the European one. Unlike onshoring, which may involve establishing entirely new domestic operations, reshoring denotes a reversal of prior decisions to externalize production abroad. This strategy is often driven by rising foreign labor costs, concerns over quality control, supply chain fragility, or political incentives to restore domestic employment and industrial capacity. A prominent example of reshoring is General Electric's decision in the 2010s to relocate some of its appliance manufacturing from China and Mexico back to Kentucky, in response to quality control issues and logistical delays.

Friendshoring (also referred to as *ally-shoring*) represents a third approach, whereby firms or governments relocate or diversify supply chains toward countries considered political or economic allies, rather than bringing production entirely back home. The objective is to retain the benefits of international sourcing and production while reducing exposure to geopolitical risks posed by adversarial states. By prioritizing partnerships with trusted nations, friendshoring aims to balance economic efficiency with strategic resilience in an increasingly fragmented global

order. A key example is Japan's initiative to financially support companies relocating production from China to Southeast Asian countries such as Vietnam and Thailand—an effort to reduce reliance on Chinese manufacturing while maintaining regional supply chains.

Battery gigafactories in Europe in 2021



Standalone or Joint Ventures



The White Gold of The Thacker Pass Lithium Mine

The Thacker Pass lithium mine, a clay extraction project in Humboldt County, Nevada, has emerged as a prominent symbol of the growing push for supply chain security in critical minerals. According to some estimates, Thacker Pass could ultimately supply up to 25% of global lithium demand, making it not only one of the largest lithium deposits in the world but also the largest known in the United States.³⁰ In January 2021, following the approval of the project's environmental impact assessment (EIA) by the U.S. Bureau of Land Management (BLM), the mine moved beyond the planning phase toward implementation. This approval process benefited from the regulatory acceleration introduced by President Trump's 2018 executive order on critical minerals, which promoted expedited permitting and "fast-tracking" procedures.

The project is led by Lithium Americas, a Canadian-based mining company that has faced criticism from Indigenous communities in Jujuy, Argentina, for excessive water use at another lithium extraction site. In response to environmental concerns, Alexi Zawadzki, the company's chief of operations for North America, emphasized a commitment to sustainability, stating: "We recycle a lot of our water. We actually generate carbon-free energy from our process, and we'll have an excess that we'll sell to the grid."³¹ Thacker Pass is only the first of many such developments; as Thea Riofrancos notes, "over one hundred projects in the western states alone have either begun the permitting process or have received initial financial backing."³²

The regulatory foundation enabling these projects is the General Mining Law of 1872, a statute originally designed to facilitate the transfer of Indigenous lands to white settlers. The law notably lacks provisions for environmental protection or water resource regulation and exempts mining companies from paying royalties to the federal government. Furthermore, the Inflation Reduction Act introduced no new regulatory measures for the mining industry, while simultaneously offering generous financial incentives.³³

The Thacker Pass project spans 18,000 acres (7,300 hectares), of which approximately 6,000 acres (2,400 hectares) are designated for active mining operations. The site is located 34 kilometers (21 miles) west-northwest of Orovada, Nevada, within the McDermitt Caldera.³⁴ In January 2023, General Motors announced a \$650 million investment in the project, securing exclusive access to the mine's initial phase of production. Subsequently, in March 2024, Lithium

³⁰ National Center for Biotechnology Information, "[The Thacker Pass Lithium Project](#)," *Environmental Health Perspectives* 131, no. 1 (2023).

³¹ Thea Riofrancos, *Extraction: Frontiers of Green Capitalism* (forthcoming, W. W. Norton, 2025), p. 141.

³² *Ibid.*

³³ *Ibid.*, p. 142.

³⁴ Nick Bowlin, "[At Thacker Pass, a Battle over the Future of the American West](#)," *The Nation*, February 2023.

Americas secured a \$2.26 billion loan from the U.S. Department of Energy, covering over 75% of the project's costs and offering more favorable interest rates and repayment terms than those available through private lenders.

Yet Thacker Pass has become a highly contested political battleground. The proposed mine has emerged as a focal point in broader debates over how to reconcile the imperative of securing critical minerals for the energy transition with the imperative of protecting biodiversity, ecosystems, and Indigenous rights.³⁵

Proponents of the project—including the Biden administration and advocates for renewable energy—argue that domestic lithium extraction is vital for the production of electric vehicle batteries and energy storage technologies, both essential to reducing fossil fuel dependence and achieving significant carbon emissions reductions.

In contrast, a coalition of ranchers, environmental organizations, and conservationists opposes the mine, citing concerns that its development will deplete groundwater resources, contaminate local waterways, degrade wildlife habitats (particularly those critical to the greater sage-grouse), and threaten endangered species such as the Lahontan cutthroat trout. Multiple legal challenges have been initiated by private landholders and environmental groups, who allege that the BLM approved the project based on incomplete and flawed environmental assessments, failing to adequately evaluate hydrological impacts or uphold protections for sensitive ecosystems and species.

Ultimately, the conflict over Thacker Pass illustrates a broader and unresolved dilemma at the heart of the energy transition: how to secure access to critical mineral resources necessary for decarbonization without reproducing the ecological harm and socio-environmental injustices historically associated with extractive industries.

³⁵ Emily Pontecorvo, "[The West Has a New Front in the War over Electric Cars](#)," *Grist*, April 2023.

Chapter 4

Green capitalism

Energy Transitions and Additions

In *More and More and More: An All-Consuming History of Energy*, Jean-Baptiste Fressoz offers a radical critique of the concept of energy transition, describing it as “the ideology of capital in the twenty-first century.” He begins by challenging the idea that energy history follows a sequence of substitutions. Instead, he argues for a cumulative dynamic in which energies have historically added to one another. The notion of transition, he explains, relies on a wait-and-see narrative that presents energy shifts as technologically driven yet unresolved—since the phase-out of fossil fuels remains unrealized.³⁶

Fressoz proposes “a completely new understanding of the dynamics of energy,” opposing the dominant “epic of energy transitions” which rests on “stagist narratives.” He underscores that “humanity has never burned so much oil and gas, so much coal and so much wood,” concluding that “primary energies have tended to add to rather than substitute each other.” Citing data such as the tripling of global wood consumption over the last century and coal’s 300% growth from 1980 to 2010, he challenges the established thesis of a shift from an organic to a mineral economy.³⁷

He attributes the persistence of the transition narrative to methodological biases in energy history. First, the “epics on energy” genre narrates a linear path from wood to renewables. Second, a bias toward technological novelty produces a proliferation of “chrononyms” such as “the age of coal.” Third, a mono-energetic approach isolates energy forms from each other and from broader material regimes. To counter these, Fressoz extends his earlier thesis of accumulation by proposing a vision of “symbiotic expansion,” encompassing overlooked technical interdependencies.³⁸

³⁶ Jean-Baptiste Fressoz, *More and More and More: An All-Consuming History of Energy* (New York: Penguin, 2024), pp. 14, 19, 26, 31, 333. Note that all page numbers provided in this review refer to the original French edition.

³⁷ *Ibid.*, pp. 15–17, 26.

³⁸ *Ibid.*, pp. 20–21, 25, 55.

This notion of symbiosis raises epistemological questions. Fressoz critiques the “blurred nature of energies” and warns against “linguistic conveniences that obscure” complex entanglements. In the pre-fossil era, energy symbiosis relied not only on slavery but also on peasant labor, oilseed mills, and vast grasslands. In the fossil era, coal relied on wood for mine props, oil depended on coal-based infrastructure, and industrial agriculture “pétrolized” wood.³⁹

Fressoz then reconstructs the genealogy of the transition concept. He asks: “How was ‘transition’ able to take hold at the end of the twentieth century, when the whole energy dynamic of the time contradicted it?” He traces its emergence from the Technocrat Movement, the Atomic Energy Commission, the IASA, and IPCC Working Group III. Central here is the logistic (S-) curve, adapted from population ecology and used by Marion King Hubbert to model coal and peak oil. Rather than predicting decline, Hubbert imagined a “transition to fast-breeder reactors.”⁴⁰

Technocratic visions were extended by atomic Malthusians who promoted nuclear expansion as a solution to scarcity and climate risk. In 1967, physicist Harrison Brown repurposed “transition” from nuclear physics (where it referred to the state change of electrons) into a social metaphor akin to “demographic transition.” Cesare Marchetti at IASA then promoted relative energy shares over cumulative data to model substitution, influencing Nordhaus’s future-oriented scenarios.⁴¹

Nordhaus imagined an eventual economy based solely on hydrogen and infinite electricity. In a 1975 paper, he assured readers: “we have a comfortable amount of time to carry out research and draw up plans to reduce CO₂ should this prove necessary.” For Fressoz, the transition narrative is a “wait-and-see approach” that legitimizes delay, as evidenced by Exxon’s 1982 declaration: “we have entered an energy transition”—a statement he interprets as a rationale for inaction.⁴²

Yet Fressoz rejects the charge of defeatism. He stresses that his target is not renewable energy itself, but the ideological deployment of transition discourse. His aim is to clarify both “the depth of the problem” and “the essential obstacles on the road to decarbonization.” He insists that decarbonization is “a necessary condition [that] is far from sufficient,” pointing out that electricity production—only partly decarbonized—represents just 40% of global CO₂ emissions. Hard-to-abate sectors like aviation, shipping, steel, and plastics account for over a quarter of emissions. The real task, Fressoz argues, is not to await a new transition, but to enact a radical “amputation” of three-quarters of global energy use within four decades.⁴³

³⁹ Ibid., pp. 44, 46, 187.

⁴⁰ Ibid., pp. 202, 213, 219.

⁴¹ Ibid., pp. 224, 236, 263, 269.

⁴² Ibid., pp. 282–283, 287, 333.

⁴³ Ibid., pp. 16, 321, 329–330.

He ends by posing the political challenge. Fressoz highlights the early critique by physicist David Rose, who in 1980 rejected smooth transition narratives and called for profound economic and political change. While Fressoz does not outline a concrete alternative, he gestures toward ecosocialist degrowth, arguing that “getting out of carbon will be far more difficult than getting out of capitalism,” the latter being “probably necessary but certainly not sufficient.” The book’s refusal to propose a roadmap reflects its polemical aim: to challenge “the normative positions on climate that prevail in the social sciences.” By emphasizing addition and symbiosis over substitution and transition, Fressoz reframes the technical and political conditions of exiting the fossil economy.⁴⁴

⁴⁴ Ibid., pp. 23, 290, 332.

From Geoengineering to Climate Engineerings

In light of the failure to meet the 1.5 °C cap set by the Paris Agreement and the inadequacy of radical emission-reduction strategies targeting greenhouse gases (CO₂, CH₄, N₂O), adaptation-oriented solutions to an increasingly accepted climate catastrophe have gained traction in public discourse. The so-called era of “overshoot” (Malm and Carton) of planetary thresholds is accompanied by a growing advocacy for geoengineering. According to the canonical definition offered by the Royal Society in 2009, geoengineering refers to “the deliberate large-scale manipulation of the planetary environment to counteract anthropogenic climate change.”⁴⁵

Two principal categories of geoengineering interventions are generally distinguished: carbon dioxide removal (CDR) and solar radiation management (SRM). Since 2007, most IPCC-modeled scenarios for achieving net-zero carbon by 2050 have incorporated CDR technologies. These include, on the one hand, “forestry-based” approaches such as afforestation, reforestation, and halting deforestation, and on the other, BECCS (bioenergy with carbon capture and storage), aiming to reach either net-zero emissions (where CO₂ emissions equal CO₂ removals) or even negative emissions.⁴⁶

SRM encompasses a range of techniques designed to enhance Earth’s albedo (the proportion of incoming solar radiation reflected by a surface). These include urban interventions—like brightening city surfaces, implemented in Los Angeles and New York—as well as high-risk proposals such as stratospheric aerosol injection (SAI) and marine cloud brightening. Such strategies have been advocated as emergency measures to avoid triggering major climate tipping points, including the thawing of Arctic permafrost, the collapse of the West Antarctic Ice Sheet, or the dieback of tropical forests.⁴⁷

As Xavier Landes notes, the Royal Society’s definition of geoengineering rests on three criteria: the deliberate character of the intervention, the planetary scale of its implementation, and the intention to partially or fully neutralize anthropogenic climate change. Intentionality serves to distinguish geoengineering from the concept of the Anthropocene, understood as a geological epoch marked by the unintended consequences of human activity becoming the dominant force shaping Earth systems. However, such a distinction between intentional geoengineering and the “accidental Anthropocene” (Lewis and Maslin) risks obscuring both the deliberate production of

⁴⁵ Royal Society, [Geoengineering the Climate: Science, Governance and Uncertainty](#), 2009, Andreas Malm, Wim Carton, *Overshoot: Climate Politics When It’s Too Late*, Londres, Verso, 2024.

⁴⁶ Xavier Landes, *Géoingénierie*, Paris, PUF, coll. « Que sais-je ? », 2024, p. 8.

⁴⁷ *Ibid.*, p. 9.

ignorance by “merchants of doubt” throughout the 20th century—who actively undermined scientific consensus on greenhouse effects first identified by Eunice Foote (1856) and Svante Arrhenius (1896)—and the potentially hazardous unintended effects of the most dangerous geoengineering techniques. Notably, stratospheric sulfur injection could damage the ozone layer, result in acid rain, or cause respiratory illness.⁴⁸

The second definitional criterion—the scale of intervention—presupposes actions targeting the “planetary environment.” Yet certain measures operate on a more localized level, including the enhancement of urban albedo or the targeted protection of cryospheric zones (glaciers, permafrost, sea ice). Prominent examples include the Arctic Ice Project, Cambridge University’s “Refreeze the Arctic” initiative, or the “Marine Cloud Brightening for the Great Barrier Reef” experiment, all based on the high albedo properties of fresh snow and cumulonimbus clouds (both with albedo values around 0.9).⁴⁹

The third criterion—climate-specific intent—serves to distinguish geoengineering from military uses of weather modification. A paradigmatic case is Operation Popeye (1967–1972), when the U.S. Air Force seeded clouds over Laos with silver iodide to extend the monsoon season and render the Ho Chi Minh trail impassable. Such practices are explicitly prohibited under one of the few binding international legal instruments relevant to geoengineering: the 1976 ENMOD Convention.⁵⁰

The term “geoengineering” itself remains contentious. The prefix “geo-” refers to the Earth rather than the climate specifically, while the suffix “-engineering” evokes a Promethean hubris—an excessive confidence in the ability to control natural systems. This is why institutions such as the U.S. National Research Council have advocated for the more neutral expression “climate intervention.” Xavier Landes proposes instead the term “climate engineerings” to better capture the multiplicity of methods grouped under a common objective: “human interventions in the climate system intended to alter local or global radiative forcing in order to slow, halt, or reverse climate change and/or its associated harmful effects.”⁵¹

Finally, carbon removal technologies—such as carbon capture and storage (CCS) and direct air capture—are increasingly supported within “green” industrial policy frameworks. Yet ecosocialist

⁴⁸ Ibid., p. 11 et p. 21 ; Simon L. Lewis, Mark A. Maslin, *The Human Planet: How We Created the Anthropocene*, Londres, Pelican Books, 2018 ; voir aussi Eunice Foote, “Circumstances Affecting the Heat of the Sun’s Rays”, *American Journal of Science and Arts*, vol. 22, 1856 ; Svante Arrhenius, “On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground”, *Philosophical Magazine and Journal of Science*, vol. 41, 1896.

⁴⁹ Landes, *Géoingénierie*, p. 12.

⁵⁰ Ibid., p. 16 ; [Convention ENMOD](#) (Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques), Organisation des Nations unies, Genève, 1976.

⁵¹ Landes, *Géoingénierie*, p. 24.

theorists Andreas Malm and Wim Carton warn that the dominant classes of fossil capitalism may instrumentalize climate engineering to ensure the continued profitability of fossil assets. A paradigmatic example is provided by ExxonMobil, which invests in CCS not to sustainably reduce emissions, but to reinject captured carbon into oil reservoirs via “enhanced oil recovery” (EOR) techniques. This strategy illustrates how climate engineering may be co-opted as a techno-fix that serves to prolong fossil fuel extraction rather than phase it out.⁵²

⁵² Andreas Malm, Wim Carton, *Overshoot: Climate Politics When It's Too Late*, Londres, Verso, 2024 ; Landes, *Géoingénierie*, p. 27.

Geopolitics and Secular Stagnation

Coined by the economist and historian Edward N. Luttwak in 1990, the term *geo-economics* captures the idea of “warfare by other means.” He defines it as “the logic of conflict in the grammar of commerce.”⁵³ According to Luttwak, capital investment and product innovation guided by the state become the “equivalent of firepower” and the “equivalent of weapon innovation,” while “market penetration supported by the state replaces military bases and garrisons on foreign soil as well as diplomatic influence.” Richard Nixon echoed this sentiment: “Still others contend that, as the Cold War waned, the importance of economic power and ‘geo-economics’ has surpassed military power and traditional geopolitics. America, they conclude, must beat its swords not into plowshares, but into microchips.”⁵⁴

Geoeconomic analysis articulates the security imperatives of the state (the domain of geopolitics) with the profit imperatives of private firms (the domain of markets). However, the security logic of the state and the profit-maximization strategies of transnational capital do not stand in an external contradiction. Instead, according to a growing body of critical scholarship, geopolitical rivalries should be studied as an internal contradiction of capital accumulation in the era of “secular stagnation.”

The term *secular stagnation*, coined by Keynesian economist Alvin Hansen in 1938, is today often associated with Robert Brenner’s analysis of the “long downturn” of the world economy since the post-war boom. First elaborated in *The Economics of Global Turbulence*, Brenner’s argument focuses on the problem of global industrial overcapacity that developed after WWII. Under the threat of communism in Europe and East and Southeast Asia, the U.S. supported technological transfers to Germany and Japan. However, the rapid expansion of manufacturing capacity worldwide soon led to persistent overcapacity, triggering what Brenner calls a “long downturn” in manufacturing-output growth. Rising international competition among industrial producers depressed profits and ushered in an era of economic stagnation.⁵⁵

Between 1950 and 1973, U.S. manufacturing grew at an annual rate of 4.4% and GDP at 4.0%, reflecting robust postwar expansion. From 1974 to 2000, growth slowed to 3.1% for manufacturing and 3.2% for GDP. Between 2001 and 2017, both declined further, with manufacturing growth at

⁵³ Edward N. Luttwak, “From Geopolitics to Geo-Economics: Logic of Conflict, Grammar of Commerce,” *The National Interest*, Summer 1990.

⁵⁴ Richard Nixon, *Seize the Moment: America’s Challenge in a One-Superpower World*, New York: Simon & Schuster, 1992, p. 23.

⁵⁵ Robert Brenner, *The Economics of Global Turbulence: The Advanced Capitalist Economies from Long Boom to Long Downturn, 1945–2005*, London: Verso, 2006.

just 1.2% and GDP at 1.9%, marking a significant long-term deceleration.⁵⁶ Despite China's industrial rise, Brennerite analysts argue that this exception proves the rule, noting that China itself entered a phase of deindustrialization starting in 2014.⁵⁷

Globally—including China—these trends mirror those of high-income countries. In the 1950s and 1960s, global manufacturing value added (MVA) and GDP grew at impressive rates of 7.1% and 5.0% annually, with MVA consistently outpacing GDP. From the 1970s onward, both global MVA and GDP growth rates decelerated, though MVA generally maintained a slight lead. Notably, between 2008 and 2014, both grew at the exceptionally low rate of just 1.6% per year.

Economist Jamie Merchant argues that in this context of global secular stagnation—where the economy increasingly resembles a zero-sum game—escalating geopolitical rivalries must be understood as an immanent contradiction of capitalist development itself: “The return of industrial policy and the onset of premature deindustrialization are two sides of the same historical dynamic: falling worldwide profitability, the thickening concentration of capital, and an expanding population of surplus humans that governments are frightened of but which national economies are unable to absorb. In this context, pursuing ‘industrial policy,’ as the U.S. is doing, simply means destroying one’s competitors, even if it means starting World War III. At least these measures will be accompanied by reassuring homilies about the sanctity of the rules-based international order.” Merchant stresses that “in a world in which growth is scarce and ideas scarcer,” industrial policy is not a “pathway to some egalitarian, post-carbon social democracy,” but rather “a strategy that capitalist countries are forced to adopt to defeat one another on the shifting stage of global competition.”⁵⁸

The various national forms this takes—Bidenomics in the U.S., Germany’s Industrial Strategy 2030, China’s Made in China 2025, India’s Make in India initiative, and others—are all part of a global dynamic of intensified geoeconomic competition in a zero-sum world. If growing geopolitical tensions are an expression of a stagnant world economy where the pie of growth is shrinking, then the geoeconomic turn is unlikely to offer a true solution to the underlying profitability crisis.

⁵⁶ The Conference Board, *International Comparisons of Productivity and Unit Labour Costs*, July 2018 edition.

⁵⁷ Aaron Benanav, *Automation and the Future of Work*, London: Verso, 2020.

⁵⁸ Jamie Merchant, “[The Economic Consequences of Neo-Keynesianism](#),” *The Brooklyn Rail*, July 2023.

Neo-Mercantilism and the Capitalism of Finitude

Mercantilism, the dominant economic doctrine in Europe from the 16th to the 18th century, is based on the idea that a nation's wealth depends on the accumulation of precious metals (notably gold and silver), achieved through maintaining a trade surplus. From this perspective, mercantilists advocate for an interventionist economic policy in which the state plays a central role by promoting exports and restricting imports. Mercantilism conceives of the economy as a "zero-sum game," where one nation's gain necessarily comes at the expense of others. National variants of mercantilism emerged, such as bullionism in Spain, focused on gold accumulation; Colbertism in France, which promoted industrialization and manufacturing; and commercialism in England and the Netherlands, emphasizing maritime trade.⁵⁹

Neo-mercantilism, a modern adaptation of this doctrine, retains the same objective of strengthening national economic wealth and power through trade surpluses, but operates in a contemporary context, employing modern tools such as renewed protectionism, export support, and strong state intervention to boost national competitiveness. Although their historical contexts differ—absolute monarchies and colonial trade for mercantilism; a globalized economy and international competition for neo-mercantilism—both doctrines share a common goal: ensuring national enrichment and power through state intervention and a sustained trade surplus.⁶⁰

Rather than resorting to the term *mercantilism*, which tends to overemphasize protectionism and limit its historiographical focus to the period before the 19th century, historian Arnaud Orain proposes a new dynamic periodization of capitalism that distinguishes between liberal capitalism and what he terms the "capitalism of finitude." The latter currently manifests itself through "the questioning of free trade, competitive mechanisms, and the return of an autarkic conception of the economy; the exponential growth of private monopolies turned into Company-States; the undermining of the freedom of the seas; general rearmament; a new scramble for land, minerals, and living species."⁶¹

The liberal period, according to Orain, extends from 1815 to the end of the 19th century, re-emerges after 1945, and peaks again in the neoliberal era. In contrast, the capitalism of finitude unfolds across three phases: the 16th–18th centuries; 1880–1945; and 2010 to the

⁵⁹ Lars Magnusson, *The Political Economy of Mercantilism*, Routledge, 2015.

⁶⁰ Henry Farrell and Abraham L. Newman, "Weaponized Interdependence," *International Security*, Vol. 44, No. 1 (2019), pp. 42–79.

⁶¹ Arnaud Orain, "[Mercantilisme et capitalisme de la finitude : aux origines de l'empire Trump](#)," *Le Grand Continent*, 20 mars 2025 ; see also Arnaud Orain, *Le monde confisqué. Essai sur le capitalisme de la finitude*, Paris, Flammarion, 2025.

present. It is defined as “a vast naval and territorial enterprise of asset monopolization—lands, mines, maritime zones, enslaved people, warehouses, submarine cables, satellites, digital data—conducted by nation-states and public or private companies in order to generate rent income outside the competitive principle.”⁶²

Three key features characterize this mode of capitalism. First, the “closure and privatization of the seas,” entailing a blurring between naval and commercial fleets. Second, the erosion of commercial multilateralism and the downgrading of competitive markets. Third, the formation of informal or formal empires through the territorial expansion of public and private actors. Unlike liberal capitalism, which is based on growth, abundance, and a belief in win-win exchanges, the capitalism of finitude conceptualizes economic life as a zero-sum game, grounded in the exhaustion of resources and the impossibility of universal abundance.⁶³

The predatory logic of European colonization in the early modern period gave way in the 19th century to the pax Britannica and liberal globalization. This liberal order waned at the turn of the 20th century under the weight of inter-imperial rivalries and ecological anxieties, which culminated in two world wars. It re-emerged after 1945 and again in the 1990s, under the banner of a “Flat Earth” marked by global digital connectivity and Chinese industrial expansion. But the return of resource conflicts and geopolitical fragmentation signals a shift back toward finitude.⁶⁴

Three developments illustrate this shift. First, growing maritime insecurity: challenges to the freedom of navigation by Brazil, China, the Houthis, and Somali or Gulf of Guinea pirates; China's naval expansion; and the decline of American commercial maritime capacity. As Orain notes, the United States is “a naval power without being a maritime power.” Trump's pledge to revitalize the shipbuilding industry, both commercial and military, marks an attempt to reassert American control over this strategic domain.⁶⁵

Second, the convergence of the MAGA movement and Silicon Valley elites reveals a rejection of competitive liberalism. Peter Thiel's claim that “capitalism and competition are opposites” underpins a political economy where monopolies are not only tolerated but encouraged, in the form of private “Company-States” operating rockets, satellites, cables, and intelligence infrastructure.⁶⁶

⁶² Ibid. See also Pierre Charbonnier, *Vers l'écologie de guerre. Une histoire environnementale de la paix*, La Découverte, 2024.

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Peter Thiel, *Zero to One: Notes on Startups, or How to Build the Future*, Crown Business, 2014.

Finally, Trump's second-term ambitions reflect a new imperial project based on territorial annexation and sovereign projection—exemplified by proposals to integrate Canada as the 51st state or annex Greenland. Such ambitions signal the overt return of territorial imperialism as a core logic of capitalist accumulation under conditions of finitude.⁶⁷

⁶⁷ Orain, "Mercantilisme et capitalisme de la finitude," *Le Grand Continent*, 2025.

Northvolt's Bankruptcy

Northvolt, a Swedish battery producer founded in 2015 by former Tesla executive Peter Carlsson, emerged as a central figure in Europe's ambitions to develop a sustainable battery industry and reduce dependence on Asian manufacturers. The company rebranded from SGF Energy in 2017 and launched large-scale projects such as the Northvolt Ett gigafactory in Skellefteå, Sweden, aiming to produce batteries with minimal environmental impact.

Northvolt attracted over \$15 billion in investments from major firms including Volkswagen, BMW, and the European Investment Bank, securing customer orders totaling \$55 billion by 2023¹. However, the company soon encountered production delays at its Skellefteå facility due to technical problems, a shortage of skilled labor, and challenges tied to its remote location.

Operational setbacks were compounded by safety incidents, including an explosion and the deaths of five workers, raising questions about workplace safety standards. Financial difficulties intensified as the company faced rising costs, layoffs, and order cancellations from key customers like BMW, which cited delivery delays and quality concerns.

In November 2024, Northvolt filed for Chapter 11 bankruptcy protection in the United States, attempting to restructure its debt, but these efforts failed to secure new financing. This was followed by a formal bankruptcy filing in Sweden in March 2025, marking the end of Northvolt as a major industrial player.

Northvolt's collapse had broader implications for Europe's green industrial policy, reducing the workforce, halting projects like its joint venture Novo Energy with Volvo Cars, and reinforcing the competitive advantage of Asian battery producers such as China's CATL.

Sources

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Chapter 5

History of geoeconomics

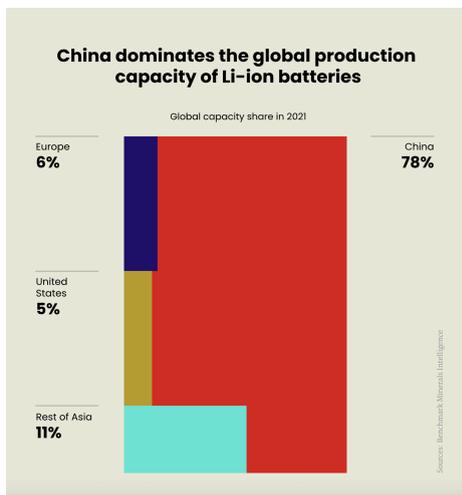
Timeline

A Brief History of Geoeconomics from the 1970s to Trump 2.0

In geoeconomics, recent history is often framed as a shift from neoliberalism to a new era of state-led competition, where strategic control over resources and supply chains eclipses market liberalization. While the neoliberal state aimed to liberalize capital flows and suppress democratic constraints, today's model blends capital accumulation with geopolitical aims. Political theorist Thea Riofrancos challenges this stagist view, highlighting how supply chain securitization began under neoliberalism and persists today. She proposes a dynamic periodization with four key turning points: the 1970s energy crisis, the 2008 financial and commodity crises, Trump's 2016 pivot to protectionism, and Biden's industrial policy for green tech dominance.

1973 - OPEC and the First Wave of Resource Security

OPEC's rise in the 1970s marked a turning point in Global South sovereignty over resources, challenging Western control by nationalizing oil industries. The 1973 oil shock, Chile's 1971 copper nationalization, and rising fears of resource scarcity spurred U.S. policies like Nixon's "Project Independence" and Carter's energy security push. These revived WWII-era stockpiling strategies, including lithium. Today's calls for a "Lithium OPEC" echo this earlier scramble to control extractive frontiers central to global capitalism.



2008 - The Commodity Boom

The 2008 commodity boom, driven by China's industrial rise, exposed Global North anxieties over resource dependence amid the financial crisis. While the U.S. reeled from economic collapse and movements like Occupy rose, resource-exporting nations thrived. Rare earth elements—vital for green tech—became a strategic concern as China gained control over 70% of supply. These materials, though not rare geologically, pose severe environmental and health risks in China, where lax regulation has led to toxic pollution and rising cancer rates in mining regions.

2016 - Resource Security under Trump's First Mandate

In 2018, the Trump administration expanded the definition of "critical minerals," easing regulations to boost domestic extraction, notably of lithium. This shift, rooted in economic nationalism, linked mineral policy to national security and industrial revival. Executive Orders and bipartisan bills like Murkowski's "American Mineral Act" framed reliance on Chinese imports as a threat. Ethical concerns over foreign extraction—raised even by officials like Francis Fannon, then Assistant Secretary of the Bureau of Energy Resources at the State Department—bolstered calls to reshore supply chains or source from trusted allies to safeguard the clean energy transition.





2020 – Biden’s Industrial Push for Green Dominance

The Biden administration expanded Trump-era mineral policies, tying resource security to the energy transition. A 2021 supply chain review led to a vertically integrated lithium strategy, invoking the Defense Production Act and funding mining, R&D, and recycling. The 2021 Infrastructure Act and 2022 IRA and CHIPS Acts provided billions in incentives while imposing strict sourcing rules to limit Chinese inputs. By 2024, Biden raised tariffs sharply on Chinese EVs, batteries, and minerals, framing green tech dominance as both economic and geopolitical strategy—blurring the line between climate action and protectionism.

2025 – Trump 2.0

Since returning to office in 2025, Trump launched an aggressive critical minerals agenda. Executive Orders 14241 and 14272 invoked the Defense Production Act, expedited permits, and investigated import risks. Another order promoted offshore seabed mining for cobalt and rare earths. In May, 10 new mining projects were fast-tracked under the FAST-41 program. These moves aim to boost U.S. resource autonomy and reduce dependence on China, while securing dominance in tech-critical minerals—paradoxically paired with a broader rollback of renewable energy investments.



Chapter 6

Ecomodernism vs degrowth

Ecological Planning

Long relegated to the margins of history following the collapse of the Eastern bloc, the idea of planning is experiencing a critical resurgence today in response to the ecological crisis.⁶⁸ It now appears simultaneously as a *political tool for transforming fossil capitalism* and as the *organizing principle* of a forthcoming ecosocialist mode of coordination. In truth, these are one and the same historical process, whose own dynamic rules out any final closure or definitive stabilization.⁶⁹

In the context of the energy transition, ecosocialist planning would consist in *coordinating the critical phase of decarbonization* by directing the remaining volumes of fossil fuels toward the construction of low-carbon infrastructure. Such a model presupposes the introduction of democratic *rationing mechanisms* for critical resources—metals, water, land—based on both ecological and social criteria.⁷⁰

The fundamental characteristic of this planning paradigm lies in the *socialization of the means of production*, which is the condition for genuine democratic and ecological control over investment decisions. It breaks with the privatization of economic choices under fossil capital, still driven by the short-term pursuit of profitability. Through socialization, production can be reoriented from the maximization of exchange value toward an organization centered on the *production of use values and the satisfaction of fundamental social needs*.⁷¹

⁶⁸ Razmig Keucheyan and Cédric Durand, *Comment bifurquer. Les principes de la planification écologique*, Zones, 2024; Troy Vettese and Drew Pendergrass, *Half-Earth Socialism: A Plan to Save the Future from Extinction, Climate Change and Pandemics*, Verso, 2022; Michael Löwy, "Écosocialisme et planification démocratique," *Écologie & Politique*, 37(3), 2008, pp. 165–180.

⁶⁹ Benanav, A. (2022). [Socialist Investment, Dynamic Planning, and the Politics of Human Need](#). *Rethinking Marxism*, 34(2), 193–204.

⁷⁰ Vettese and Pendergrass, *Half-Earth Socialism*.

⁷¹ Löwy, "Écosocialisme et planification démocratique."

Such a redefinition calls for a reconsideration of the ideal of emancipation as a *collective capacity for self-limitation*, grounded in principles of justice and sustainability.⁷² Against the classical technocratic horizon of planning—summed up by Engels’s famous dictum that socialism entails replacing “the government of persons” with “the administration of things”—this self-limitation necessitates the design of deliberative mechanisms.⁷³

In contrast to the productivist logic of Soviet-era planning, which was geared toward the single objective of optimizing production, ecosocialist planning relies on the democratic arbitration of multiple goals. It draws on Otto Neurath’s critique of pseudo-rationality, which holds that reducing economic coordination to a single metric—especially price—constitutes a flattening of collective rationality. By contrast, a planning model based on *calculation in kind* allows for the integration of heterogeneous physical quantities: hectares of land, tons of CO₂, megawatts of energy, and more.⁷⁴

This conception does not presuppose any form of social harmony akin to Fourierist utopias. On the contrary, it takes seriously the irreducible conflicts that characterize post-capitalist society in the Anthropocene. Planning must reckon with the scarcity of land: how to reconcile the large-scale deployment of solar and wind infrastructure—which requires vast land use—with the preservation of agricultural zones and rewilded areas, essential to slowing species extinction and preventing zoonotic pandemics.⁷⁵

Ecological planning also responds to a *problem of scale*. It transcends both the localist imaginaries of eco-anarchist thought inspired by Murray Bookchin and the national-scale frameworks of Green New Deal programs in the United States and Europe. As a translocal coordination apparatus, it seeks to address the entangled planetary crises of the Anthropocene—global warming, biodiversity collapse, disruption of biogeochemical cycles—which scientists now describe as the crossing of multiple planetary boundaries.⁷⁶

Finally, by breaking with the centralism characteristic of Soviet planning, ecosocialist planning aims to articulate sustainable autarky with interterritorial solidarity. The latter is necessary to account for and compensate the unequal socio-spatial distribution of the causes, effects, and

⁷² Keucheyan and Durand, *Comment Bifurquer*.

⁷³ Friedrich Engels, *Socialisme utopique et socialisme scientifique*, 1880.

⁷⁴ Vettese and Pendergrass, *Half-Earth Socialism*; see also Marius Bickhardt, François-Xavier Hutteau, Ulysse Jacquin, "[Half-Earth Socialism : planification écosocialiste contre technocratie verte ?](#)", *Terrestres*, 1er décembre 2023.

⁷⁵ Vettese and Pendergrass, *Half-Earth Socialism*, chap. 2.

⁷⁶ Richardson, J., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S.E., et al., “Earth Beyond Six of Nine Planetary Boundaries,” *Science Advances*, 9(37), 2023.

adaptive capacities related to the ecological crisis—that is, the three structural vectors of contemporary climate injustice.⁷⁷

⁷⁷ Adam Tooze, "[The climate emergency really is a new type of crisis – consider the ‘triple inequality’ at the heart of it](#)" *The Guardian*, November 23, 2023.

Eco-modernism or degrowth?

The contemporary climate debate on the Left is increasingly polarized between two broad orientations: eco-modernism and degrowth.⁷⁸ Proponents of eco-modernism generally advocate resolving the climate crisis through the accelerated deployment of renewable infrastructures, large-scale public investment in low-carbon energy, and techno-scientific innovation. One can distinguish between a right-wing eco-modernism, exemplified by the Breakthrough Institute's *Ecomodernist Manifesto*,⁷⁹ and a left-wing variant, articulated by figures such as Matthew Huber and Leigh Phillips, who propose an eco-socialist investment strategy grounded in democratic planning and worker control over production.

By contrast, advocates of degrowth emphasize the necessity of reducing the overall material and energy throughput of the global economy to remain within the biophysical limits of the Earth system—specifically, the “critical zone” of planetary habitability. While *right-wing degrowth* tends to focus on new metrics of economic accounting beyond GDP and the transformation of lifestyles and consumption patterns, *left-wing degrowth*—championed by authors such as Kohei Saito, Daniel Tanuro, Michael Löwy, and Matthias Schmelzer⁸⁰—calls for a fundamental break with the structural growth imperative of capitalism, rooted in the logic of extended capital accumulation.

Yet in practice, it is neither feasible nor conceptually coherent to strictly separate the need to expand renewable infrastructures from the imperative to reduce the use of finite resources such as sand, water, and energy. It is through the lens of ecological planning—where the investment-driven logic of eco-socialist modernization converges with mechanisms of material and energy rationing in a period of tight carbon constraints—that the two orientations may be productively synthesized. In this perspective, the remaining carbon budget must be strategically allocated to building the infrastructure of a low-carbon future, allowing a reconciliation of the objectives of eco-modernization and degrowth both in theory and in practice.

⁷⁸ Ståle Holgersen, “[Neither Productivism nor Degrowth](#),” *Spectre*, September 18, 2023, ; Benjamin Kunkel, “[Your Life and Mine: The Intractable Puzzle of Growth](#),” *The Nation*, October 24, 2023, ; Benjamin Kunkel and Lola Seaton, eds., [Who Will Build the Ark? Debates on Climate Strategy from ‘New Left Review’](#) (London: Verso, 2023). See also the polarized debate between Kai Heron and Matthew Huber/Leigh Phillips: Kai Heron, “[Forget Eco-Modernism](#),” *Verso Blog*, July 20, 2020; Matthew Huber, “[Mish-Mash Ecologism](#),” *New Left Review Sidecar*, August 10, 2020.

⁷⁹ “[An Ecomodernist Manifesto](#),” The Breakthrough Institute, April 2015.

⁸⁰ Kohei Saito, *Slow Down: The Degrowth Manifesto*, trans. Brian Bergstrom (New York: Astra House, 2024); Daniel Tanuro, *Green Capitalism: Why It Can't Work*, trans. Jane Ennis (London: Merlin Press, 2013); Michael Löwy, *Écosocialisme: L'alternative radicale à la catastrophe écologique capitaliste* (Paris: Mille et une nuits, 2011); Matthias Schmelzer, Andrea Vetter, and Aaron Vansintjan, *The Future Is Degrowth: A Guide to a World beyond Capitalism* (London: Verso, 2022).

Chapter 7

Trump's energy emergency

The Contradictions of "Energy Emergency"

The declaration of a National Energy Emergency by Donald Trump in January 2025 (Executive Order 14156) reveals the deep contradictions at the heart of his administration's energy policy. On the one hand, it seeks to accelerate domestic extraction of critical minerals; on the other, it actively undermines the clean energy industries—electric vehicles (EVs), wind, and solar—that represent the primary source of demand for these very resources.

Trump's executive order frames the United States as facing an "energy emergency" caused by overregulation, declining fossil fuel output, and excessive foreign dependence on critical materials. One of its core objectives is to strengthen domestic extraction and processing of minerals such as lithium, copper, nickel, cobalt, and rare earth elements. The administration has pledged to fast-track mining projects—for instance, lithium extraction in Nevada and rare earth production in Texas and Alaska—while also repatriating mineral refining capacities currently dominated by China. More broadly, it aims to position the U.S. as a global leader in "critical energy resources," not only for clean energy applications but also for defense and other strategic sectors.

This vision aligns with a neo-mercantilist logic of resource nationalism, in which securing sovereign access to key industrial inputs is cast as a matter of national security. The underlying ambition is to preserve U.S. industrial and military competitiveness in the emerging global race for control over energy-relevant minerals.

Paradoxically, however, the same emergency framework is being used to dismantle or delay clean energy infrastructure. The Trump administration has suspended or cancelled permits for major renewable energy projects, particularly offshore wind. A notable example is Equinor's Empire Wind project off the coast of New York, which is reportedly losing around \$50 million per week due to federal permitting freezes. In parallel, the administration has rolled back electric vehicle tax credits and other incentives introduced under the 2022 Inflation Reduction Act. It has also

revised EPA regulations in ways that slow the planned phase-out of internal combustion engine vehicles, thus favoring gasoline-powered cars. At the same time, it has moved to expand fossil fuel infrastructure, including pipelines and export terminals.

Adding to the internal incoherence of this policy mix is Trump's pledge to double U.S. liquefied natural gas (LNG) exports by 2028, primarily under the banner of "liberating allies" from dependence on Russian or Chinese energy. This strategy involves the construction and expansion of LNG terminals—particularly in Texas and Louisiana—and the reinforcement of long-term fossil fuel infrastructure, which runs counter to global climate neutrality goals. It also diverts public investment, political capital, and institutional support away from the development of renewable energy and the decarbonization of national energy grids.

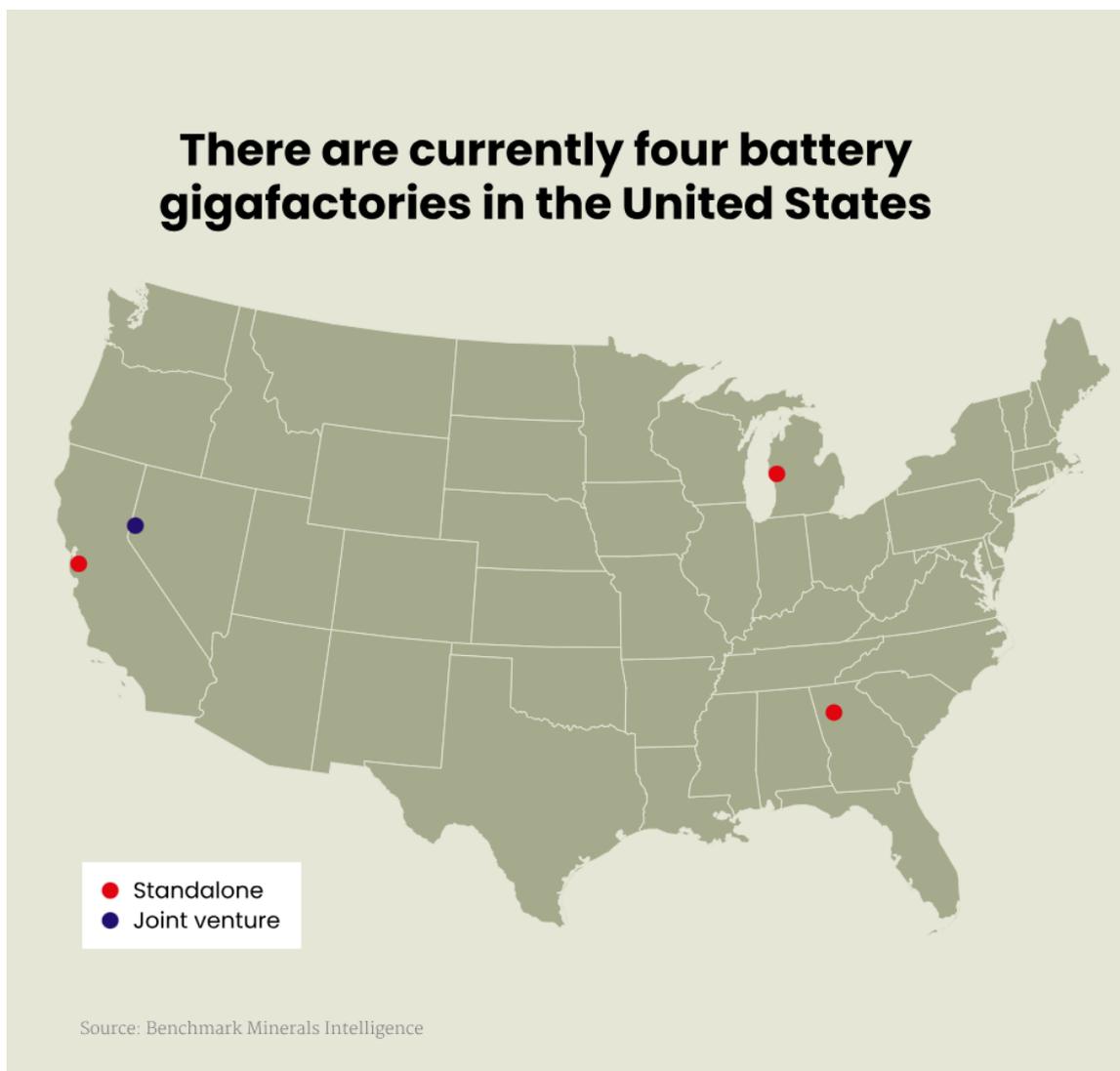
Although framed as a geostrategic maneuver intended to project American power and influence abroad, the material effect of this export agenda is to undermine efforts to build a post-fossil energy system at home. The contradiction is thus structural: Trump's energy emergency accelerates the production of resources for a transition it simultaneously seeks to block.

Chapter 8

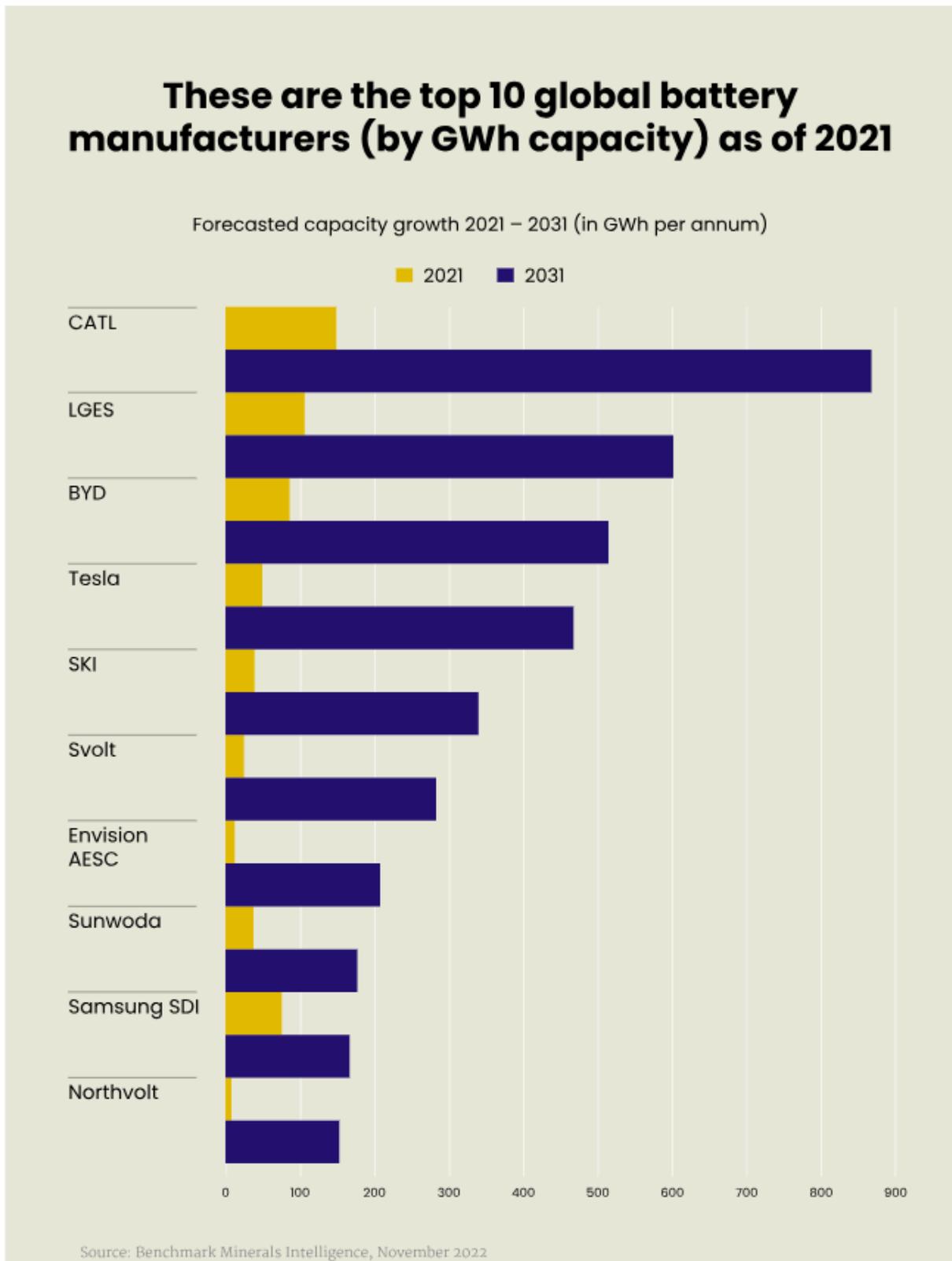
Insecurity and unsustainability under Trump 2.0

Battery gigafactories in the US in 2021

According to Benchmark Minerals, there are four battery gigafactories in the United States in 2021.



Top 10 Global Battery Manufacturers (by GWh Capacity) in 2021/2031



Chapter 9

Critical mineral deals from Ukraine to Rwanda

The Era of Critical Mineral Deals

The global scramble for critical minerals has ushered in a new era of geopolitical bargaining, marked by resource nationalism, securitization, and intensifying competition. In her *Financial Times* article, Thea Riofrancos underscores how the label of "critical minerals" is being weaponized to justify aggressive state intervention and bilateral deals that prioritize extraction over cooperation and sustainability⁸¹.

Since Donald Trump's return to office, the U.S. has dramatically escalated its efforts to assert "mineral dominance," combining executive orders with inflammatory rhetoric and pressure tactics—ranging from bullying Ukraine and Greenland to seeking privileged access to Congo's cobalt in exchange for military assistance. But Trump is not alone. The EU, too, signed a minerals agreement with Rwanda, despite widespread criticism of Rwanda's role in fueling conflict in eastern Congo to secure access to valuable ores.

What's emerging is a bifurcated landscape. Importing countries use tools like friendshoring and domestic mining incentives to secure supply, while exporting nations impose restrictions or nationalize resources in a bid to regain control. These tensions are not new: the concept of "critical minerals" has historical roots in wartime supply anxieties and the Cold War arms race. But today's mineral diplomacy risks repeating the violent and extractive patterns of the past under the guise of green industrial policy.

Riofrancos argues for a decisive shift—from mineral dominance to multilateralism. Rather than racing for access, she calls for global agreements on environmental and labor standards, and policies aimed at reducing demand. Without such changes, the transition to a green economy risks triggering a 21st-century resource war.

⁸¹ Thea Riofrancos, "[The 'critical minerals' rush could result in a resource war](#)" *Financial Times*, April 22, 2024.

Chapter 10

From opportunistic greening to fossil fascism

Climate Denials

Climate denial has a long history. In their landmark book *Merchants of Doubt*, published in 2010, Erik M. Conway and Naomi Oreskes trace the origins of what they call “the modern era of fighting facts.” They reveal how a small group of scientists, closely tied to commercial and ideological interests, systematically obscured the truth on issues ranging from tobacco smoke and nuclear winter to acid rain, the ozone hole, and global warming.⁸² Their account highlights both ruptures and continuities in the history of denialism. Recurring tactics include invoking the multifactorial nature of environmental problems, exaggerating scientific uncertainty, and attributing change to natural variability rather than human causes. Just as enduring are the roles played by conservative think tanks such as the George C. Marshall Institute, the Cato Institute, and the Heritage Foundation. Key figures—Frederick Seitz, Fred Singer, William Nierenberg, and Robert Jastrow—all veterans of Cold War science and the Manhattan Project, reappear throughout this history.⁸³

This evolution gives renewed relevance to the hypothesis of “fossil fascism” as proposed by the Zetkin Collective.⁸⁴ Building on the concept coined by Cara Daggett, the Collective argues that “far-right climate politics have evolved in conjunction with the enduring material interests of dominant classes.”⁸⁵ From this perspective, the ideological function of climate denial is to secure the long-term interests of fossil capital. When climate policy poses the threat of a “structural” crisis—for capital dependent on fossil energy—or even an “existential” one—for fossil capital in its most primitive, extractive form—various fractions of capital seek to protect their material interests by sustaining denialism.

⁸² Naomi Oreskes and Erik M. Conway, *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming* (New York: Bloomsbury, 2010).

⁸³ *Ibid.*

⁸⁴ Zetkin Collective, *White Skin, Black Fuel: On the Danger of Fossil Fascism* (London: Verso, 2021).

⁸⁵ *Ibid.*, p. 16.

This denial can take three non-exclusive forms: denial of *trend*, *attribution*, and *impact* of global warming.⁸⁶ Historically, two main periods of denialism can be identified. The first corresponds to the era of American denial, driven by the fossil lobby from the late 1980s. It was followed by a second wave carried by the contemporary far right.

The denial campaign took off in the wake of the IPCC's creation in 1988. As early as 1989, Exxon was already seeking to "cast doubt on scientific conclusions regarding its alleged contribution to the greenhouse effect," and a coalition of fossil multinationals—Global Climate Coalition—openly challenged the scientific consensus. In the same year, the conservative George C. Marshall Institute released its first denialist report.⁸⁷

The Zetkin Collective describes this institutional context as the emergence of a "climate denialist ideological state apparatus," drawing on Louis Althusser's theoretical framework. Althusser defined an Ideological State Apparatus (ISA) as "a system of institutions, organizations, and corresponding practices" that reproduce dominant ideology.⁸⁸ The Marxist critique of climate denial thus complements Andreas Malm's theory of fossil capital by adding an ideological dimension.

The meaning of this climate-denialist ISA becomes clearer in light of Marx's threefold definition of ideology: first, as "the prevailing ideas in a given social formation"; second, as "the ideas of the ruling class [which] are, in every epoch, the ruling ideas"; and third, as "the ideas by which the ruling class exercises its domination over the subordinate classes."⁸⁹ This last definition, which articulates the "political dimension of consciousness and theory," legitimizes social domination. The originality of the Zetkin Collective lies in its emphasis on the *performative* function of denialist ideology: it is not merely justificatory, but also acts as an active *production of ignorance* concerning environmental risks.⁹⁰

Following the American campaign, "every far-right party on the political scene of the early 21st century has openly expressed climate denialism"—from Alternative für Deutschland (AfD) and Forum voor Democratie (FvD) in the Netherlands to UKIP in the UK, Vox in Spain, and Donald

⁸⁶ Ibid., p. 13.

⁸⁷ Oreskes and Conway, *Merchants of Doubt*, op. cit.

⁸⁸ Louis Althusser, *Sur la reproduction* (Paris: PUF, 2011), p. 113.

⁸⁹ Karl Marx, *L'idéologie allemande*, in *Œuvres*, vol. 3 (Paris: Gallimard, 1982), p. 372. Oreskes and Conway, "Challenging Knowledge: How Climate Science Became a Victim of the Cold War," in *Agnotology: The Making and Unmaking of Ignorance*, ed. by Robert N. Proctor and Londa Schiebinger (Stanford: Stanford University Press, 2008), pp. 55–89.

⁹⁰ Naomi Oreskes et Erik Conway, "Challenging Knowledge: How Climate Science Became a Victim of the Cold War", in Robert N. Proctor et Londa Schiebinger (dir.), *Agnotology: The Making and Unmaking of Ignorance* (Stanford : Stanford University Press, 2008), pp. 55–89.

Trump in the United States.⁹¹ Yet the export of the American model of manufactured doubt to Europe brought with it an ideological shift. While the original apparatus was rooted in defending free-market ideology, the renewed wave of denialism increasingly relies on “ethnic nationalist ideology” and “hostility toward immigration.” This evolution does not contradict the eco-fascist inflection of denialism, which now takes the form of green nationalism.⁹²

Although some segments of the contemporary far right promote a so-called “patriotic ecology,” this should be seen primarily as a strategy to legitimize harsher anti-immigration policies under the guise of environmental protection, rather than as a genuine challenge to the fossil fuel status quo.

⁹¹ Zetkin Collective, *White Skin, Black Fuel*, op. cit.

⁹² Pierre Madelin, *La tentation écofasciste. Écologie et extrême droite* (Montréal: Écosociété, 2023).

Fossil Fascism

The concept of *fossil fascism*, introduced by political theorist Cara Daggett, has been further developed by the Zetkin Collective.⁹³ Fossil fascism—also referred to as “carbo-fascism”⁹⁴—describes a political configuration in which, faced with the perceived threat of eco-socialist or “eco-Leninist” decarbonization policies, segments of fossil capital align themselves with right-wing populist movements in order to preserve the fossil fuel status quo. Its ideological foundation is a persistent and multifaceted form of climate denialism.

Fossil fascism increasingly coexists with a broader “ecologization” of fascism in parts of Europe—a tendency that contrasts with the early 20th-century “fascization” of neo-Malthusian ecology and eugenics in the United States.⁹⁵ In contemporary Europe, green nationalism often takes the form of xenophobic and Islamophobic environmental Malthusianism, in which opposition to climate-related migration is framed around the defense of a national “carrying capacity” allegedly threatened by overpopulation.

Importantly, fossil fascism and climate liberalism are not entirely oppositional. The failure of market-based decarbonization strategies—particularly socially unjust instruments such as carbon taxes—has fueled legitimacy crises that open political space for fossil-fueled authoritarianism. At the same time, the growing criminalization of climate activism signals an authoritarian shift that prefigures the illiberal contours of fossil fascism.

⁹³ Cara Daggett, “[Petro-Masculinity: Fossil Fuels and Authoritarian Desire](#),” *Millennium: Journal of International Studies* 47, no. 1 (2018): 25–44,; Zetkin Collective, [White Skin, Black Fuel: On the Danger of Fossil Fascism](#) (London: Verso Books, 2021).

⁹⁴ Jean-Baptiste Fressoz, “[Bolsonaro, Trump, Duterte... la montée d’un carbo-fascisme](#),” *Libération*, October 10, 2018.

⁹⁵ Pierre Madelin, [La tentation écofasciste. Écologie et extrême droite](#) (Montréal: Écosociété, 2023).

Stranding of Fossil Assets

Stranded assets refer to fossil fuel reserves and infrastructure—such as coal plants or oil pipelines—that “can no longer earn an economic return as a result of changes associated with the transition to a low-carbon economy.”⁹⁶ To meet the 1.5°C target of the Paris Agreement, approximately 60% of oil and gas reserves and 90% of coal reserves must remain unexploited. This renders many existing fossil assets effectively obsolete, turning them into liabilities before the end of their expected economic lifespan.

While energy companies are the most visibly exposed, the risk extends across sectors that are carbon-intensive or heavily dependent on fossil fuels—such as aviation. Factors that can lead to asset stranding include regulatory changes (e.g., carbon pricing), shifts in market demand, or litigation against major emitters.

The financial repercussions are potentially immense. According to a 2022 estimate, at least \$1.4 trillion in oil and gas assets globally are at risk of becoming stranded.⁹⁷ Asset stranding could have cascading effects across the financial sector, including impacts on banks, pension funds, and insurance companies. In response, fossil capital is seeking to avoid the forced devaluation of its assets, not least by diversifying into emerging sectors such as geoengineering and carbon capture—an approach exemplified by ExxonMobil.

⁹⁶ Grantham Research Institute on Climate Change and the Environment, [What are stranded assets?](#), LSE, July 27, 2022.

⁹⁷ *Ibid.*, citing Semieniuk et al. (2022) on estimated global exposure.