

## **Climate Change, Coal and Cars: Commodity Fetishism in the Energy Transition in Indonesia**

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**ABSTRACT:** The global rush to replace fossil fuels with cleaner forms of energy have generated the conditions for Indonesia to become a new resource frontier. The acceleration of extraction and smelting of nickel, in high demand by global manufacturers of electric vehicles, is wiping out island agriculture and fisheries in Indonesia. At the same time, coal production in Indonesia continues to increase for both export and domestic use, including for the country's burgeoning nickel industry. In this paper, we present the political economy of the global energy transition as it is playing out in Indonesia today, specifically looking at the beneficiaries and losers of nickel and coal production. We then apply the Marxist concept of commodity fetishism and Gunderson's critique of the defetishization thesis to problematize the greening of extractivism in Indonesia. Commodity fetishism involves the masking of the labour expended to produce commodities by treating the commodities as if they are objects with inherent value. The defetishization thesis argues that alternative markets can lead to a less mystified relationship with commodity production by giving consumers information about how the commodities are produced. We join critics of this thesis as it applies to the greening of extractivism in Indonesia. A new layer of commodity fetishism is being produced that serves to hide the devastating conditions under which energy is being produced in Indonesia.

**KEYWORDS:** Coal; Commodity Fetishism; Extractivism; Defetishization; Energy Transition; Indonesia; Nickel.

### **Introduction**

This paper traces the making of Indonesia into a resource frontier for renewable energy, growing out of its long and interwoven history of nickel and coal production. Indonesia is promoting the expansion of nickel mining as part of its green economy strategy and long-term economic development planning. The contradictions are evident in that Indonesia has a stated commitment of achieving net zero greenhouse gas emissions by 2026 or sooner (IEA, 2022) and yet it expands coal production as well as carbon-intensive laterite nickel mining to meet the demand for electric vehicle (EV) batteries, slowing down the transition to renewable energy in the country. Indonesia's energy demands jumped nearly 60 per cent from 2000 to 2021, with coal being used to fill the demand (IEA, 2022; Sangadji et al., 2025). Coal exported from Indonesia has also skyrocketed, rising 8 per cent in 2024 from the year before (USGS, 2025).

After presenting a brief history and political economy of Indonesia's nickel and coal industries during the colonial and post-colonial periods, we apply the Marxist concept of commodity fetishism and Gunderson's critique of the defetishization thesis to discuss how such perspectives can demystify the social relations of fossil capitalism behind today's so-called green energy transition in Indonesia.

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The transition to a future low-carbon economy is linked to an explosion in the extraction of so-called critical metals or transition metals such as nickel, copper and cobalt (Hund et al., 2020; IEA, 2023), including in former no-go zones like the seabed (Lidström et al., 2024). We argue that so-called ‘green extractivism’ involves the expansion of new resource frontiers that is reproducing historical patterns of accumulation and dispossession seen in zones of resource extraction of the past (Andreucci et al., 2023; Astuti et al., 2025), while also evoking colonial notions that represent local people as being incapable of their own development (Andreucci et al., 2023; Butler, 2015).

The International Energy Agency estimates that as much as 70 per cent of total nickel demand by 2040 will come from clean energy technologies (IEA, 2021a). Indonesia is already the world’s largest nickel producer, extracting more than half of the world’s supply in 2024 (USGS, 2025). In the nickel rush driven by market demand for EV batteries, Indonesia is opening more nickel mines and smelters, with a much larger footprint – in what the country is calling nickel industrial parks, without taking the pedal off coal mining. This paper challenges climate activists to be attentive to the concrete processes that have been set in motion under the rubric of the so-called energy transition that directly run counter to its intended goals.

### **Indonesia’s Early History of Fossil Capitalism**

Fossil capitalism is a concept that links hydrocarbon energy (oil, gas and coal) to the expansion of capitalism and reorganization of global production and accumulation (Malm, 2016; Marley, 2016). Indonesia’s history of hydrocarbon energy and resource extraction predates its 1945 founding as a nation. Petroleum was first exploited in the late 18th century in East Kalimantan (Wood, 1985). The Dutch colonial government began mining coal in East Kalimantan in 1861 then in West Sumatra, starting in 1892. Coal extraction continues on these islands today. Dutch companies exploited nickel in the Sorowako region of the island of Sulawesi and began exporting it to Europe in the 1930s (Sangadji, 2021). Prior to the Dutch colonial period, nickel mining and smelting in the region were carried out for domestic use (Robinson, 1986). Under Dutch colonization (1861-1941), Japanese occupation (1942-1945) and the current post-colonial period, resource exploitation has primarily benefited colonial powers and capitalists, which can explain why Indonesia is today on the frontier of a new rush for metals to fuel the renewable energy economy.

Today, Indonesia continues to grapple with the legacy of colonial agrarian laws as communities claiming *adat* (customary) status refuse displacement and dispossession. The state must decide which territories it wants to recognize as *adat* and what that means. The Dutch East Indies put into place laws and policies aimed at supporting private interests (Neilson, 2020). From 1830 to 1870, the Dutch formally adopted a policy of *cultuurstelsel* (forced cultivation system) where peasants across Java and other areas of Indonesia were forced to produce coffee, sugar, and indigo for the colonial administration (Neilson, 2020). This unfree form of labour exploitation was replaced by exploitation through private land tenure when the Dutch colonial administration passed the 1870 *Agrarian Laws* that encouraged *domein verklaring* (free state domain). The principle allowed the colonial administration to hand over land to private interests and encouraged European investment in large-scale commercial coffee, tea, sugar and rubber plantations (Neilson, 2020). If Marx and Engels (1848) were correct in their assessment that capitalism was establishing itself as a global system that “must nestle everywhere, settle everywhere, establish connections everywhere,” historically it came to be established in Indonesia by the armed political power of Dutch colonial capital between 1861-1870.

After Indonesia became independent in 1945, Indonesia began a period of self-reliance and non-alignment under Sukarno, the first President of Indonesia (Bevins, 2020), cancelling mining permits issued by the Dutch East Indies and nationalizing private firms owned by Dutch mining companies (Project Multatuli and Singgih, 2024). Indonesia's anti-imperialist posturing ended when Western powers including the U.S supported the 1967 military coup in which General Soeharto overthrew Sukarno. From 1965 to 1966, Soeharto, a high-ranking army general, oversaw the killings of approximately one million people affiliated with the Indonesian Communist Party (PKI) and political left in the country (Bevins, 2020). Budiardjo (1986: 1219) characterized the Soeharto regime as a "violent and ruthless military bureaucracy" that controlled "all facets of life" and had a "fanatical hatred for left-wing ideology and political Islam--two ideologies that have long traditions of mass support in the country."

Soeharto's pro-capitalist interventions, corruption and attempts to squash left-wing opposition did not stop the Marxists, scholars and artists, such as Indonesia's most celebrated writer, Pramoedya Ananta Toer, from resisting the regime. Many of them became political prisoners, spending years in jail. Soeharto introduced the 'Pancasila' concept, integrating a mixture of five religious and political tenets, under the aegis of which atheists and communists were marked as enemies of the state (Budiardjo, 1986; Gellert, 2015). With no substantial middle class or national bourgeoisie presence at the time of Soeharto's ascent, petty bourgeois interests threatened by the communists played a key role in advancing Soeharto's authoritarian regime that justified state intervention in the national interest (Hadiz, 2004). Private interests with political influence and national interests aligned behind a regime that used brutal means to develop the country in their vision (Hadiz, 2004).

As part of Soeharto's modernization vision for Indonesia, his regime used the 'Pancasila' concept to force people to convert to one of the state's recognized religions, which had the effect of suppressing ethnic diversity (Großmann et al., 2017). Furthermore, while promoting paternalistic notions that Indigenous peoples of Indonesia were backwards and primitive, Soeharto engaged in a nation-building program that banned ethnicity, religion, race, and group affiliation in political spheres with a stated purpose of avoiding national fragmentation (Großmann et al., 2017). The purging of anyone labeled a dissident or communist and the replacement of nationalist, anti-imperialist Sukarno with an anti-Communist, pro-West Soeharto as president of Indonesia were huge wins for the U.S. and capitalism during the Cold War era when the U.S. tried to stop the influence of the Soviet Union and spread of communism (Bevins, 2020; Gellert, 2015; Panitch and Gindin, 2012). As president, Soeharto, backed by the U.S. and other Western powers, immediately set out to make foreign investment and economic development the country's main priorities (Bevins, 2020; Gellert, 2025). Resource exploitation by foreign companies soon became a cornerstone of Indonesia's path to economic development. Indonesia treated opposition to resource extraction as an activity that went against state interests and therefore subjected it to varying levels of state repression depending on the location, timing and nature of the resistance.

While there are numerous cases of historical and ongoing exploitation of bauxite, tin, gold, coal, nickel, and other metals and minerals to discuss in relation to predatory capitalist interests in Indonesia, the following section of the paper will discuss how the nickel operation in Sorowako, today majority-owned by Vale from Brazil and previously by Inco Ltd. from Canada, has operated during different post-colonial eras in the country. This case study will illustrate how laws, policies, institutions and ideologies have served to displace and dispossess people in the interests of mining investors.

## Nickel Mining in Sorowako

The Vale operation in Sorowako on the island of Sulawesi is the longest running nickel mining and smelting operation in the country, established within two decades following Indonesia's independence from Dutch colonial rule and Japanese occupation in 1945. In fact, Vale dates its history in Sorowako back to July 25, 1968, one year after Soeharto came to power, but the company that founded the operation, Inco Ltd., had a geologist, H.R. Elves, go to Sulawesi decades before, in 1937, to study nickel laterite deposits (Project Multatuli and Singgih, 2024).

Inco benefited from the Soeharto's administration enactment of foreign-investor friendly legislation. Soeharto's 1967 *Foreign Investment Law* cleared the way for foreign investment in the mining sector, establishing a Contract of Work system (Multatuli and Singgih, 2024). *Basic Forestry Law No. 5*, also enacted in 1967, turned most of Indonesia's forest areas, including the forests around the nickel operation, into state-controlled property that could more easily be exploited (Rachman and Siscawati, 2016). At the same time, Soeharto was negotiating joint ventures with multinational companies. In 1968, PT Inco, majority-owned by Canadian nickel mining company Inco Ltd. (taken over in 2006 by Vale of Brazil) became the second multinational mining investor to sign a joint venture or Contract of Work with Indonesia.

With Soeharto in power and clearly on the side of foreign investors, companies such as Inco Ltd. began establishing operations in the country in the late 1960s. Ownership of these operations changed hands in the following decades while extraction persisted. Post-Soeharto governments continued to promote export-oriented mining for revenue and economic development for Indonesia (Asmarini and Munthe, 2017; Resosudarmo, 2005). The strategic importance of mining for Indonesia's economy makes resistance to extractivism difficult.

Extractivism, different than extraction, involves economies built around the extraction, export and sale of resources (Acosta, 2013; Gudynas, 2018; Foster, 2024). Such an extractivist mode of accumulation encourages processes of internal colonization, rent-seeking and erosion of local democratic institutions while also exacerbating poverty, local conflict, environmental degradation, gender inequality and other social inequalities (Acosta, 2013, Astuti et al., 2025). Extractivism extends to other economic sectors besides mining, agriculture and logging, such as call centres and sweatshops, and has become a main feature of capitalism (Ye et al., 2020). Ye et al. (11) argue that extractivist networks are: "void (their debts often are higher than their assets). They do not contribute anything new (they take over and combine already existing resources and apply already existing technologies, etc.), they do not produce value – they just drain value that is produced by others or is lying dormant in the subsoil and they do so through the application of extra-economic power and/or financialization." Furthermore, Patel and Moore (2017) contend that extractivism reproduces global capitalism through a process that cheapens nature, money, work, care, food, energy and lives.

In Indonesia, extractivism is supported by the government through investor-friendly regulations and providing permits to both foreign-owned and state-owned mining and logging companies. When Soeharto's Indonesia claimed the forests of different customary or ethnic communities across the country as state forest in 1967, it opened the territories to extractivism (Großmann et al., 2017; Myers et al., 2017). The Indonesian state facilitated establishment of the Inco nickel mine by forcing people to give up land and shifting cultivation, which they had practiced for generations (Robinson, 1986).



Fig. 1. Sorowako residents grow rice and other crops in the shadow of the Vale nickel smelter. Fourteen Karonsi'e Dongi and Sorowako women interviewed in 2015 said their families grow crops and fish for subsistence or to supplement income earned from contract work at the mining and smelting operations (Glynn and Maimunah, 2023, 2024). Photo by author.

The Inco nickel operation attracted thousands of people from across Indonesia seeking work and a better life to Sorowako, transforming the rural community into a bustling town. However, locals have long felt they do not benefit as much as outsiders do in terms of jobs and services. Protests against the nickel operation related to unfair land acquisition, environmental impacts and disparate access to jobs and social services date back to the 1970s and have continued sporadically to this day by the different ethnic groups that claim the territory in the mining area, including the Karonsi'e Dongi and Sorowako peoples (Glynn and Maimunah, 2023).

During and following Soeharto's years as president, discourses on nationalism and the 'Asian Difference' (accounts of how modernity was playing out differently in Asia than in the West), and Indonesia's nationalized oil and timber sectors delayed some of the neoliberal reforms for a time. Furthermore, in Southeast Asian countries such as Indonesia, neoliberalism did not necessarily take the form of a rolled-back state (Nevins and Peluso, 2008). Governments across the Southeast Asia region, including nationalist governments, made what Ong (2006) called exceptions to accommodate aspects of neoliberalism to participate in the global capitalist economy. While some neoliberal reforms were delayed in Indonesia, neoliberalism would take hold in the country in ways that benefited the elite with interests in extractivism. These reforms have included lifting of barriers for foreign investment and export-oriented production. Such

reforms came relatively late to Indonesia, since as a loyal anti-communist ally, the U.S. tolerated Soeharto's statist policies (Nevins and Peluso, 2008; Panich and Gindin, 2012).

The 1997 Asian financial crisis and countrywide protests set in motion the end of Soeharto's decades-long reign, which occurred in 1998. International financial institutions pressured the country into making political and financial reforms, including 140 neoliberal structural adjustments (Aspinall, 2013; Panitch and Gindin, 2012).

Neoliberalism in Indonesia is shaped by what Gellert (2019) calls an altered state developmentalism, where land rights are nominally acknowledged but the state reinforces an ideology of development that supports free markets as the way to achieve growth and prosperity. Indonesia's economic and political elite support consumerism and point to Jakarta's mushrooming skyscrapers and the country's growing per capita Gross Domestic Product as evidence of Indonesia's course to prosperity. They argue Indonesia can prosper if it curbs corruption and educates its populace (Gellert, 2015). However, this neo-modernizationist development model will not solve the country's structural inequalities because it is "a vision of life for a privileged and transnationalised segment of the population" (Gellert, 2015: 308). Indonesia, known as one of the 'tiger cubs' or 'little dragons,' remains home to stark contrasts of immense wealth next to severe poverty (Astuti et al., 2025; Tadjoeiddin et al., 2021). Critics of ahistorical neo-modernization theory do not share the elite's optimism that Indonesia's economic and social problems will dissipate through individual responsibility and consumerism (Gellert, 2015).

Accused but never convicted of war crimes, retired Army General Susilo Bambang Yudhoyono was elected president in 2004 and again in 2009. Yudhoyono, trained by the U.S. military, oversaw Indonesian soldiers sent to occupy East Timor in the 1970s when Indonesia committed acts of genocide (Budiardjo, 1986). Before Yudhoyono left office, he banned raw metal ore exports so that firms would build smelters and create jobs (Asmarini and Munthe, 2017). In 2017, the Joko Widodo (Jokowi) administration eased the ban on exports of nickel and bauxite ores (Warburton, 2018). Jokowi promoted state-led development and continued the resource nationalism set in motion by Yudhoyono, nationalizing some of the assets held by multinational mining companies in the country, including those controlled by Freeport McMoran (Kim, 2022).

The country's elite, many with fortunes made from mining and extractivist policies, has enormous political clout in post-Soeharto Indonesia. Electoral politics in Indonesia is a transactional space for the country's oligarchs to further their power and fortunes. Local regent and governor candidates pay enormous amounts of money to run in elections. An electoral politics of this nature serves the elites who can sponsor their candidate or themselves. For example, Jokowi's vice-president was Yusuf Kalla, founder of the Kalla Group. The Kalla Group has interests in mining, energy, construction, finance, automotives, among other sectors (Kalla, 2025). While Indonesia is said to be on a path of democratization following the fall of Soeharto, the economic elite in Indonesia continues to exercise its power, compromising democratization efforts.

Besides controlling who runs and gets elected in Indonesia, private resource and energy interests maintain close relationships with village heads, customary chiefs and army officers. They take advantage of ambiguous laws and their weak enforcement to grab land and resources for their own benefit (Bakker, 2016; Li, 2014).

Despite the promises of regional autonomy laws that passed in 2001 to decentralize government and give local people more power over their affairs, the Indonesian state and its functionaries still possess a large degree of power in local matters. Furthermore, the patronage being handed out at the local level is driving a 'decentered clientelism' that supports neoliberalism on the ground as it also hinders state-led development efforts and contributes to the fragmentation

of various government and civil society institutions (Aspinall, 2013). Promises of decentralization have yet to be realized due to a powerful oligarchy that controls electoral politics and large sectors of the resource economy.

Outside institutions have also affected the way that decentralization has played out in Indonesia. The World Bank and International Monetary Fund have promoted decentralization ostensibly to put local resources in the control of local people. However, the international financial institutions funded the design and technical assistance of such decentralization efforts in the neoliberal vision (Aspinall, 2013). The suite of policy prescriptions imposed on Indonesia have included privatization of state enterprises, deregulation to facilitate free markets, reduced social spending, and legal protections for property rights. While the Indonesian state implemented numerous neoliberal economic reforms to obtain loans from these institutions, the country has continued to own and control many sectors of its economy (Aspinall, 2013), including mining. Indonesia's state-owned company, ANTAM, has owned or co-owned several mining ventures with multinational mining corporations across the country since 1968 when it formed from a merger of several state-owned mining companies (ANTAM, n.d.).

National and local governments have made weak attempts to make resource extraction more beneficial to local communities, while it continues to deny people of Sorowako and across the archipelago from fully benefiting from the extraction of resources from their land (Glynn and Maimunah, 2023, 2024). Local government officials have periodically attempted to increase the benefits and amount of revenue from the Inco mining operations but with little success. For example, in 1999, local government officials where Inco operates requested that the contract between Inco and the government of Indonesia be reviewed, but they later backed down when Inco threatened international arbitration against such an action (Mizwar, 2003).

Governments prioritize investment and employment from mining and therefore undertake policies to support their continued presence. Vale (n.d.) employs 2,934 workers at its Indonesian operations. The power of the mining company to intervene in national policies has been evident in its ability to obtain favourable laws, taxes and government regulation, even when this means contravening laws written for environmental protection. For example, after banning mining in protected forests, the government introduced a regulation in 2004 that allowed some investors, including Inco, to mine in protected forests. This regulatory exception has remained in place even though a Constitutional Court ruling recognized the negative effects of mining in protected forests (Maimunah, 2012).

Since the advent of colonial rule and capitalism, enclosures and commodification of the land and people for government-backed megaprojects such as mining have been resisted (Sangaji, 2007; Tsing, 2002). States have used their repressive apparatus to allocate resource-rich land to private interests or national enterprises, including state-owned oil, gas, mining and timber operations, and plantations (Nevins and Peluso, 2008; Tadjoeeddin et al., 2021). In Sorowako, community members have long resisted the acquisition of their land for mining (Glynn and Maimunah, 2023).

Mining interests in Indonesia have also benefited from new laws and initiatives that prioritize attracting investments, including by categorizing nickel mining and processing as a national strategic project (Astuti et al. 2025) and the omnibus *Job Creation Law* passed in 2020 (JATAM, 2020). The Law aims to make it easier to do business in the country through simplifying licensing processes, land acquisition and environmental impact assessments, and providing more incentives to free trade zones that benefit foreign investors including in the mining sector (JATAM,

2020; UNCTAD, 2020). The *Job Creation Law* as well as amendments to the 2009 *Mining and Coal Law* have been protested by JATAM, Indonesia's mining watchdog (JATAM, 2020).

In summary, Indonesia's colonial past followed by the 32-year authoritarian reign of Soeharto and the post-Soeharto neoliberal period have all shaped the nature of resource extraction in the country and forms of resistance to that industry. The state remains captured by capitalists and a political elite and is thus unable to fully implement the kinds of democratic and economic reforms that could more fully benefit local populations affected by resource extraction. While resistance to the dispossession caused by mining has become more open following the fall of Soeharto, local opponents continue to be repressed and criminalized.

### **'Green Extractivism' or a Third Layer of Commodity Fetishism?**

Increasingly, scholars and activists are calling for climate solutions to go beyond 'green extractivism' that favours external accumulation at the expense of locals, often the rural poor (Bruna, 2022). Extractivism must be understood in spatial terms, as a chain of processes from digging through to transportation, burning, smelting, consumption and waste disposal (Martin, 2017, 23; Martinez-Alier & Mariana, 2016). 'Green extractivism' refers to a paradox where a colonial and destructive mode of extraction and accumulation is hailed as a climate solution (Dunlap et al., 2024).

EV demand has grown sharply in recent years (IEA, 2023) as state actors commit to stabilizing the global average temperature to no more than 1.5 degrees Celsius above pre-industrial levels (IPCC, 2018). States have supported a slew of ineffective market-based and technological solutions to the climate change problem. The case of Indonesia demonstrates how the selected means for ending climate change can conflict with the stated aim. Expanding nickel production to meet EV battery demand runs up against the state's commitment to achieve net zero emissions by 2060 or sooner (IEA, 2022).

Before COVID-19, the Jokowi government announced it would reduce its dependency on coal-based power generation. However, in response to the pandemic, the government made the coal sector eligible for a six-month 30 per cent tax reduction and additional fiscal incentives. These developments contradict the aim of reducing coal-based power generation and further increase Indonesia's dependence on coal extraction (Quitow et al., 2021).

The rate of growth of coal power production in Indonesia is currently among the highest in the world. The world's largest coal exporter (IEA, 2024), Indonesia is also the world's third largest coal producer (Jong, 2023). Indonesia burned 33 per cent more coal in 2022 than the year before, contributing to a 20 per cent increase in the country's carbon emissions from fossil fuels, making Indonesia the world's sixth largest carbon dioxide emitter (Jong, 2023).

The expansion of nickel mining and processing has led to the clearing of more forests and land on the island of Sulawesi (Fig. 2), the Maluku islands of North Maluku, Halmahera and Obi, and West Papua. Strip-mining of nickel from Sorowako's forested hills continues to be smelted with power from coal and hydro-electric dams (Glynn and Maimunah, 2023; Sangadji et al., 2025). Coal mined in Kalimantan is exported to not only global markets but also to Sulawesi and Java where it is consumed in power plants and at nickel industrial parks (Nasir et al., 2022; Ordonez et al., 2022). Meanwhile, refining, precursor, cathode, and battery factories are located on the island of Java (Adhiguna, 2024). This is only one example of the many trans-territorial extractivist chains that exist across the archipelago (Fig. 3).

Dominating the global nickel supply chains are Chinese companies such as Huayou Cobalt and CATL that are engaged in nickel smelting, refining and battery manufacturing, and some

nickel mining in Indonesia. The batteries are predominantly produced in China for leading global EV manufacturers including Germany's Volkswagen, BMW, and Mercedes-Benz, and U.S.-based Tesla (Sangadji et al., 2025). In just three years, Indonesia has signed deals worth more than US\$15 billion for battery materials and EV production with other manufacturers including Hyundai and LG (Jo, 2024; Lotulung, 2024).



Fig. 2. Strip-mining of nickel from a hill behind one part of the town of Sorowako in 2015. Photo by author.

According to former President Jokowi, Indonesia can become the largest EV producer by 2027 if it integrates nickel production with copper and bauxite while pushing for the wider use of EVs. The emissions growth from expanding EV production and mining will likely render the country's decarbonization plans impossible (Deny, 2023). In 2020, Jokowi put an end to raw nickel exports and encouraged the construction of nickel smelters around mining sites in the form of industrial parks (Astuti et al., 2025).

Following the export ban, Indonesia became the world's largest producer, with nickel production increasing from 606,000 Mt in 2019 to 1 million Mt in 2021 (Astuti et al., 2025). The value of Indonesia's nickel exports rose from USD 4 million in 2017 to USD 34 million in 2023 (Edy, 2023). However, the downstreaming (known as *hilirisasi* in Indonesia) of nickel is not without its critics. Local communities and organizations that support mine-affected communities such as JATAM and WALHI continue to raise alarm about the social and environmental impacts of the nickel industrial sites while members of the national elite, many of them coal mining magnates, spread sovereignty concerns related to China controlling the nickel supply chain (Riyanto et al., 2025).



Fig. 3. Map of Indonesia depicting key sites of nickel and coal production and consumption. Nickel mining is occurring in Sorowako and other locations on the island of Sulawesi as well as on the islands of Maluku and West Papua. Coal mining is occurring in Kalimantan and being exported outside the country as well as shipped to Sulawesi and Java where it is consumed in power plants. Refining, precursor, cathode, and battery factories are found on the island of Java.

Despite broad evidence of environmental and social harms associated with nickel mining and smelting (Glynn and Maimunah, 2023, 2024; Nasution et al., 2024; Sangadji et al., 2025), nickel, because it is a key ingredient of EV batteries and other renewable technologies, is being called a green commodity or a green energy metal (Vikström, 2020). The energy transition is said to depend on its sustainable supply (Basuhi et al., 2024). The International Energy Agency predicts EVs and battery storage will replace stainless steel as the largest end user of nickel by 2040 (Lotulung, 2024).

Indonesia is again becoming a commodity frontier of nickel, this time in the form of battery-grade nickel. Commodity frontiers are defined as “processes and sites of the incorporation of resources into the expanding capitalist world economy” (Beckert et al., 2021, 435). Such capitalist processes have transformed and destroyed vast natural landscapes, and acquired more land and labour (Beckert et al., 2021).

An astonishing 116 nickel smelter projects are operating at various stages of development in the country. Just ten years ago, there were 31 such projects. Forty-seven nickel smelter projects are currently in operation (Project Multatuli and Singgih, 2024). Based on the government of Indonesia’s nickel mine operation data, there are 329 nickel mining companies operating in the country with a total concession of 836,000 hectares (Sangadji et al., 2025). Besides Brazil’s Vale and Japan’s Sumitomo Metals, China’s Tsingshan Holding Group, France’s Eramet, Switzerland’s Solway Investment Group and several Indonesian companies, including ANTAM are mining and smelting nickel on the islands of Sulawesi, Maluku and West Papua (GlobalData, 2024; Project Multatuli and Singgih, 2024). In 2023, Vale and Sumitomo, ranked in the top five of nickel producers in the world (GlobalData, 2024).

Processing Indonesia's nickel for EV batteries is particularly carbon intensive. Indonesia's laterite nickel requires more processing to become battery-grade nickel than sulfide nickel ore found mostly in Canada, Russia and Australia (Mudd, 2010). Indonesia's laterite ore resources are estimated to release two to six times the amount of carbon dioxide emissions as producing battery-grade nickel from sulfide deposits (IEA, 2021b). Also, most nickel smelters in Indonesia are powered by coal (Jong, 2024; Lotulung, 2024).

Besides the carbon footprint of the nickel operations, nickel mining and smelting in Indonesia is dangerous with abysmal working conditions, frequent workplace accidents, injuries and deaths, and sites of forced displacement of Indigenous peoples and livelihoods, land disputes, pollution of the air, water and fishing grounds, deforestation, increased incidences of landslides and flooding, and increased food insecurity and violence (Andreucci et al., 2023; Astuti et al., 2025; Glynn and Maimunah, 2023, 2024; Nasution et al., 2024; Riyanto et al., 2025). Sangadji et al. (2025) refer to the mass deforestation of the Halmahera rainforest for the Industrial Weda Bay Nickel Project as genocide against the Indigenous O'Hongana Manyawa people. Fewer than 500 people remain in the area today, a significant drop in population from around 3,000 two decades ago. Rapid industrialization at other sites of nickel production in the country is associated with increased crime and drug abuse, the introduction of sex work, and garbage pollution (Riyanto et al., 2025).

Nickel smelters pollute the air with sulphur dioxide, nitrogen oxides and coal ash as well as fine particles that affect respiratory health. To transform nickel ore to battery grade nickel involves less conventional methods, such as high-pressure acid leaching which produces toxic waste (Lotulung, 2024). The nickel industry has been turning to deep sea tailings disposal to dump its waste (Andreucci et al., 2023). Sulawesi fishermen near the nickel operations must travel further into the sea to catch fish and are spending more money on petrol (Lotulung, 2024). Indonesia as well as Guatemala and the Philippines are places where human rights violations are linked to the development of the world's largest nickel mines (Glynn and Maimunah, 2023, 2024; Müller and Reckordt, 2017; Nolin and Russell, 2021). These countries are also among the world's deadliest countries to be an environmental defender. In 2023, 17 of the 196 environmental activists killed or forcibly disappeared were in the Philippines, four were in Guatemala and three were in Indonesia (Global Witness, 2024).

Indonesia's nickel industrial parks have a larger ecological footprint (Sangadji, 2019). For example, the Indonesia Morowali Industrial Park, a sprawling 10,000-acre industrial site that includes 50 factories and employs around 66,000 workers, 6,000 of them from China, is producing stainless steel, carbon steel, high carbon ferrochrome and nickel pig iron. The site also has a lime plant, coke plant, acid plant, port facilities, airport, three mosques, dormitories for workers, and a four-star executive hotel (Chen, 2023; Lotulung, 2024). Ten years ago, the industrial site was rainforest (Nasution et al., 2024). Land use changes have been linked to the loss of fish for a community traditionally reliant on fishing (Chen, 2023). The company boasts being able to source abundant higher grade nickel ore which is banned from export. It also has reduced its electricity costs by having a 1.26-GW power plant on site that is powered by coal sourced in Indonesia (Bria et al., 2025). The vertical integration at these industrial parks involves using nickel ore and coal power to produce a higher output of stainless steel or other nickel products at a lower cost.

Nickel is found in the stainless steel in our forks and weapons, and now in EV batteries. As consumers of nickel, we do not think of the social and environmental harms associated with nickel's transformation into a commodity. Commodities are goods produced to be exchanged in the market for capital accumulation. For Marx (1867), the commodity form obscures the social

relations through which the commodity came to be, namely the labour expended in the production of commodities. His concept of commodity fetishism describes how commodities are treated as objects with inherent value. According to Marx's labour theory of value, the value of a commodity is measured by the average number of labour hours required to produce that commodity (Marx, 1867). Furthermore, commodity fetishism naturalizes capitalism by making it seem as if capitalism is governed by "natural laws" rather than something that can be radically transformed. The commodity form and relations rooted in commodity production turn people into things and grant social characteristics to commodities (Marx, 1867).

Allen and Kovach (2000) introduced the concept of defetishization to describe the way that green food markets can potentially combat what Marx (1867) called the "mysterious character of the commodity form." Organic food labels are said to partially demystify the consumer's relationship with food production by providing information about the conditions under which the food was produced. Such a defetishization process is supposed to challenge people to think critically about the food system, but Gunderson (2014) argues it encourages people to think of themselves as individuals and consumers, and not as responsible members of a collective. Such neoliberal subjects are also said to not consider themselves as even a bearer of rights (Brown, 2015). The elite can continue buying a green status, symbolically displaying they are more careful consumers (Gunderson, 2014) while the poor are scapegoated as the cause of environmental and social problems through their individual choices as consumers.

Commodities bestowed with the honorific of 'green' and 'ethical' fail to fundamentally counteract the pervasiveness, scale and harms of capitalism (Gunderson, 2014). Ethical consumerism does not defetishize the commodity form but to the contrary adds another ideological layer of fetish, further masking the harms of capitalism and shutting down critical interrogation of the contribution of the commodity form itself to the extractivist degradation of the environment. Gunderson (2014) argues that the defetishization thesis claims alternative markets can lead to a more honest, less mystified relationship with food production and, in turn, strengthen civil society but that it really doesn't, and in fact, adds a third layer of commodity fetishism. Similar arguments can be applied to so-called green energy production.

In 2019, Amnesty International challenged EV manufacturers to commit to sourcing "ethical batteries" (Andreucci et al., 2023). While the intentions behind such calls are laudable, this sort of civil society participation unintentionally contributes to the third layer of commodity fetishism since it ignores and therefore hides important critical interventions that expose the inherent exploitation found in how batteries are produced under capitalist social relations. Providing consumers with more knowledge about the products they consume generates the illusion of greater consumer power over the impact of their consumption, while averting their focus from a wider sociological lens able to see how their individual choices are embedded in society, specifically the social relations of production that take place not for social need but for unlimited accumulation, which entails the endless transformation of nature into a field of extraction (Foster, 2024).

Renewable energy expansion is expected to reinforce extractivist dynamics of global dependent peripheries. 'Decarbonisation by dispossession' is occurring where renewable energy expansion in the form of unprecedented mining in the Global South is disproportionately harming rural populations already historically marginalized (Andreucci et al., 2023). In the case of nickel, this expansion contributes to ecological destruction and territorial dispossession, human rights abuses and violence (Glynn and Maimunah, 2023, 2024). Decarbonizing economies in the imperial cores is resulting in green sacrifice zones across the globe (Andreucci et al., 2023).

Green extractivism, a term coined in 2017, tries to square sustainability goals with environmental destruction caused by industries under capitalism (Dunlap et al., 2017). In Indonesia, such green extractivism involves a larger environmental footprint with nickel industrial parks occupying an even larger area than previous nickel mining operations. Such parks have been described as ‘sacrificial zones’ that vertically integrate production chains with the goal of reducing costs to enhance profits (Naryono, 2023). Green extractivism generates new and more extensive extractivist chains and draws in new resources such as rare earth metals, widening the hunt for raw materials (Dunlap et al., 2017).

Expanding on the ideas of Marx, Foster et al. (2011) argue that capitalist relations to nature involve it continually creating metabolic rifts and shifts. Capital extracts more than can be replenished, exceeding natural capacities, while at the same time shifting environmental problems, either geographically, or through a change in production methods, that in turn create new forms of environmental harms. The global climate movement’s emphasis on electrification of society is being used to justify increased exploitation of metals, continuing metabolic rifts with nature that make it a false climate solution.

To be ecologically sustainable, capitalism would need to slow economic growth, so it does not overstep natural limits, and plan production to meet the basic needs of human beings and the rest of the biosphere. However, capitalism is growth-dependent and exists to expand and accumulate capital. As economies grow so does environmental degradation (Foster, 2024). As seen in Indonesia, in capitalist societies, energy production exists to increase profits, not to produce energy per se, as a social need to be satisfied. Gunderson (2014, 114) points out that the notion of ethical or green consumerism involves a third layer of commodity fetishism:

Commodity fetishism still naturalizes capitalism, as it always has—indeed, shopping to create a better world presupposes that one conceives capitalism as a given, absolute entity, favorable, or, at the very least, exceptionally malleable—but now the very same mechanisms that cause capitalism’s discontents are marketed as their own remedy, thereby making radical, structural change unappealing and seemingly preventable.

Gudynas argues that a just energy transition must involve “indispensable extraction,” that is extraction that is only “genuinely necessary” (Andreucci et al., 2023, 7). For others, climate solutions must involve a fundamental break with capitalism and colonialism (Malm and Carton, 2021; Foster, 2024; Sultana, 2023). For Sultana (2024, 6), decolonial climate solutions that respect planetary boundaries involve a “fundamental reformulation of paradigms and solidarities rooted in justice and meaningful praxis.” When considering the burden placed on local communities affected by nickel mining in Indonesia, for the global decarbonization effort, Astuti et al. (2025) argues for a “community-centric justice” focused on the lived experiences of those most harmed by extractive industries to imagine and realize more equitable and just outcomes.

## **Conclusion**

The global rush to meet the demand for metals for electrification in place of fossil fuels has caused new frontiers of capitalist resource extraction. Indonesia is just one location where capitalists have captured the climate crisis for their own gains, peddling the idea of ‘green extractivism’ when the driving motive is capitalist profit. Dispossessed peoples are left with degraded environments and rendered unable to survive from renewable sources that once sustained them.

While the rush to transition from internal combustion engine vehicles to rechargeable battery-based vehicles is supposed to reduce the carbon footprint of transportation, nickel production for EV batteries has an immense carbon footprint (Climate Rights International, 2024), which furthers our argument that extractivist chains are ultimately not green.

Large-scale resource extraction and firms specializing in frontier ‘green’ technologies in Indonesia operate in overlapping geographies with millions of people who continue to farm, fish and access the forest for a living. It is a region of immense biodiversity and resource wealth but also severely degraded landscapes, soils and waters (Struebig et al., 2022), globally known for its endangered orangutan and extinct tigers. The archipelago is home to 17 per cent of the world’s bird species, 16 per cent of the world’s reptile species, 12 per cent of the world’s mammal species and 10 per cent of the world’s flowering plant species (Von Rintelen, 2017). Mining is just one industry destroying habitats, a driving force of biodiversity loss in Indonesia (Von Rintelen, 2017).

In June 2025, the Indonesian government halted four of five nickel mining permits on the Raja Ampat islands in West Papua, citing concerns over marine pollution and deforestation. A designated UNESCO global geopark, the islands are home to 75 per cent of all known coral species (Jong, 2025). However, at other nickel production sites, the pollution continues. Chromium-6-laden sediment pollution is killing aquatic life around the Harita mining operation on Halmahera’s Obi Island (Moore, 2025). Residents blame black dust from coal burning at the Morowali Nickel Industrial Park for causing respiratory illness (Handayani, 2025).

Forging ahead with an economic development path that prioritizes extractivism and supplying resources for global markets, Indonesia is likely to continue its repression of local resistance. Prabowo Subianto, an army commander under Soeharto, was elected president in 2024. Prabowo’s cabinet includes the most-ever members with military or police backgrounds (Priamarizki and Hairpin, 2024). As expected, community leaders demanding an end to the pollution at nickel production sites are being criminalized (Moore, 2025).

Preliminary research on energy transitions shows it is replicating problems associated with the pattern of ‘resource frontiers’ of the past (Beckert et al., 2021; García and Fold, 2022). Using the cloak of climate action, Indonesia is mining nickel to put more EVs on roads. Indonesia aspires to have 2 million electric cars and 12 million electric two-wheelers by 2030 (Huda et al., 2025). The world’s largest nickel producer, Indonesia supplied over 50 per cent of the world’s nickel in 2024 (USGS, 2025). At the same time, Indonesia has become the world’s largest coal exporter in 2024 (IEA, 2024), a process of carbon lock-in initiated by former President Jokowi (Ordonez et al., 2017).

Applying the concept of commodity fetishism to today’s green energy transition serves to disrupt the spell of ‘green’ consumption that restrains our ability to solve the climate crisis by transforming our present social relations of fossil capitalism. Indonesia provides an illustrative case study of the importance of breaking with fetishistic notions that cars can be green.

## References

- Acosta, A. (2013). Extractivism and neoextractivism: two sides of the same curse. *Beyond development: alternative visions from Latin America*, 1, 61-86.
- Adhiguna, P. (2024). 0.4% of global battery production capacity: Indonesia's battery and EV developments are far out of step with its nickel exploitation promise. The Energy Institute. [https://energyshift.institute/wp-content/uploads/2024/02/Energy-Shift\\_Indonesia-nickel-and-battery\\_Feb2024.pdf](https://energyshift.institute/wp-content/uploads/2024/02/Energy-Shift_Indonesia-nickel-and-battery_Feb2024.pdf)
- Allen, P., & Kovach, M. (2000). The capitalist composition of organic: The potential of markets in fulfilling the promise of organic agriculture. *Agriculture and Human Values*, 17, 221-232.
- Andreucci, D., López, G. G., Radhuber, I. M., Conde, M., Voskoboynik, D. M., Farrugia, J. D., & Zografos, C. (2023). The coloniality of green extractivism: Unearthing decarbonisation by dispossession through the case of nickel. *Political Geography*, 107, 102997.
- ANTAM. (n.d.). Company History ANTAM. <https://www.antam.com/en/company-history>
- Asmarini, W., & Munthe, B.C. (2017). Indonesia eases export ban on nickel ore, bauxite. *Australia's Paydirt*, 1(246), 68.
- Aspinall, E. (2013). A nation in fragments: Patronage and neoliberalism in contemporary Indonesia. *Critical Asian Studies*, 45(1), 27-54.
- Astuti, R., Raman, S., & Yeremia, A. E. (2025). Putting community-centric justice into just transitions from the Global South: the case of Indonesia's nickel sector. *Environmental Research Letters*, 20(5), 054020.
- Bakker, L. (2016). "Perceiving neoliberalism beyond Jakarta." In *Rethinking Power Relations in Indonesia*, pp. 117-131. Routledge.
- Basuhi, R., Bhuwalka, K., Moore, E.A., Diersen, I., Malik, R.H., Young, E., Billy, R.G., Stoner, R., Ceder, G., Müller, D.B., Roth, R. and Olivetti, E.A. (2024). Clean energy demand must secure sustainable nickel supply. *Joule*, 8(11), 2960-2973.
- Beckert, S., Bosma, U., Schneider, M., & Vanhaute, E. (2021). Commodity frontiers and the transformation of the global countryside: A research agenda. *Journal of Global History*, 16(3), 435-450.
- Bevins, V. (2020). *The Jakarta Method: Washington's Anticommunist Crusade and the Mass Murder Program that Shaped Our World*. Public Affairs.
- Bria, E., Kemp, D., Kuswati, R. A., Sturman, K., Saputra, M. R. U., & Lechner, A. M. (2025). A holistic framework for examining complex problems in energy transition solutions. *One Earth*, 8(5).
- Brown, W. (2015). *Undoing the Demos: Neoliberalism's Stealth Revolution*. New York, NY: Zone Books.
- Bruna, N. (2022). A climate-smart world and the rise of Green Extractivism. *The Journal of Peasant Studies*, 49(4), 839-864.
- Budiardjo, C. (1986). Militarism and repression in Indonesia. *Third World Quarterly*, 8(4), 1219-1238.
- Butler, P. (2015). *Colonial extractions: Race and Canadian mining in contemporary Africa*. University of Toronto Press.
- Chen, E. (2023, May 7). The Nickel Pickle. *The Wire China*. <https://www.thewirechina.com/2023/05/07/the-nickel-pickle-tsingshan-xiang-guangda-indonesia/>

- Climate Rights International. (2024, January). Nickel Unearthed: The Human and Climate Costs of Indonesia's Nickel Industry. <https://cri.org/reports/nickel-unearthed/>
- Deny, S. (2023). Mimpi Besar Jokowi, Jadikan Indonesia Produsen Kendaraan Listrik Terbesar di 2027 [Jokowi's big dream to turn Indonesian into the biggest electric vehicle producer in 2027]. *Liputan 6*. <https://www.liputan6.com/bisnis/read/5383254/mimpi-besar-jokowi-jadikan-indonesia-produsen-kendaraan-listrik-terbesar-di-2027>
- Dunlap, A., Verweijen, J., & Tornel, C. (2024). The political ecologies of “green” extractivism (s): An introduction. *Journal of Political Ecology*, 31(1), 436-463.
- Foster, J.B., Clark, B., & York, R. (2011). *The Ecological Rift: Capitalism's War on the Earth*. NYU Press.
- Foster, J.B. (2024). Extractivism in the Anthropocene. *Monthly Review*, 75(11). <https://monthlyreview.org/2024/04/01/extractivism-in-the-anthropocene/>
- García, N. A., & Fold, N. (2022). The coloniality of power on the green frontier: Commodities and violent territorialisation in Colombia's Amazon. *Geoforum*, 128, 192-201.
- Gellert, P.K. (2015). “Optimism and Education: The New Ideology of Development in Indonesia.” *Journal of Contemporary Asia* 45(3): 371–393.
- Gellert, P.K. (2019). Neoliberalism and altered state developmentalism in the twenty-first century extractive regime of Indonesia. *Globalizations* 1-25.
- GlobalData. (2024). Nickel Mining Market Analysis by Reserves, Production, Assets, Demand Drivers and Forecast to 2030. <https://www.globaldata.com/store/report/nickel-mining-market-analysis/>
- Global Witness. (2024). Missing Voices. Global Witness Annual Defenders Report 2023-2024. <https://www.globalwitness.org/en/campaigns/environmental-activists/missing-voices/>
- Glynn, T., & Maimunah, S. (2023). Unearthing conscious intent in women's everyday resistance to mining in Indonesia. *Ethnography*, 24(1), 23-43.
- Glynn, T., & Maimunah, S. (2024). Seeing empathy as resistance: a conjunctural photovoice study of women and mining in Indonesia. *Gender, Place & Culture*, 1-23.
- Großmann, K., Padmanabhan, M., & von Braun, K. (2017). Contested development in Indonesia: Rethinking ethnicity and gender in mining. *Advances in Southeast Asian Studies*, 10(1), 11-28.
- Gudynas, E. (2018). Extractivisms: Tendencies and consequences. In *Reframing Latin American Development*, edited by R. Munck and R.D. Wise, eds. Routledge, 61-76.
- Gunderson, R. (2014). Problems with the defetishization thesis: ethical consumerism, alternative food systems, and commodity fetishism. *Agriculture and Human Values*, 31, 109-117.
- Hadiz, V. R. (2004). The rise and demise of Pancasila. *Communitarian Politics in Asia*, 148.
- Handayani, L. (2025, January 14). Kasus ISPA di Morowali Meningkatkan Akibat Aktivitas Produksi Nikel yang Masif. [Upper respiratory tract infection at Morowali rise with massive nickel Production]. *Media Nikel Indonesia*. <https://nikel.co.id/2025/01/14/kasus-ispa-di-morowali-meningkat-akibat-aktivitas-produksi-nikel-yang-masif/>
- Huda, A.A., Bridle, R., & Suharsono, A. (2025, February 7). Indonesian Electric Vehicle Boom: A temporary trend or a long-term vision? International Institute for Sustainable Development. <https://www.iisd.org/articles/deep-dive/indonesian-electric-vehicle-boom-temporary-trend-or-long-term-vision>
- Hund, K., Porta, D. L., Fabregas, T. P., Laing, T., & Drexhage, J. (2020). The mineral intensity of the clean energy transition. World Bank Publications.

- IEA. (2021a). Executive Summary. *The Role of Critical Minerals in Clean Energy Transitions*. <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>
- IEA. (2021b). GHG emissions intensity for class 1 nickel by resource type and processing route. <https://www.iea.org/data-and-statistics/charts/ghg-emissions-intensity-for-class-1-nickel-by-resource-type-and-processing-route>
- IEA. (2022). *An Energy Sector Roadmap to Net Zero Emissions in Indonesia*, IEA, Paris. <https://www.iea.org/reports/an-energy-sector-roadmap-to-net-zero-emissions-in-indonesia>
- IEA. (2023). *As their sales continue to rise, SUVs' global CO2 emissions are nearing 1 billion tonnes*, IEA, Paris. <https://www.iea.org/commentaries/as-their-sales-continue-to-rise-suvs-global-co2-emissions-are-nearing-1-billion-tonnes>.
- IEA. (2024). *Coal 2024*, IEA, Paris. <https://www.iea.org/reports/coal-2024>.
- IPCC. (2018). Summary for Policymakers. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3-24, doi:10.1017/9781009157940.001.
- JATAM. (2020). Omnibus Law: Oligarch's Legal Holy Book. 18 October 2020. <https://jatam.org/id/lengkap/omnibus-law-oligarchs-legal-holy-book>
- Jo, K. (2024). Who drives the green shift? EV and battery policymaking and systemic marginalisation of auto suppliers in South Korea. *The Extractive Industries and Society*, 20, 101538.
- Jong, H.N. (2023, July 3). Indonesia's coal burning hits record high — and 'green' nickel is largely why. Mongabay. <https://news.mongabay.com/2023/07/indonesias-coal-burning-hits-record-high-and-green-nickel-is-largely-why/>
- Jong, H.N. (2025, June 10). Indonesia halts most nickel mining in Raja Ampat, but allows one controversial permit. Mongabay. <https://news.mongabay.com/2025/06/indonesia-halts-most-nickel-mining-in-raja-ampat-but-allows-one-controversial-permit/>
- Kalla. (2025). Bisnis [Business]. <https://kalla.co.id/home>
- Kim, K. (2022). Key features of Indonesia's state capitalism under Jokowi. *Jas (Journal of Asean Studies)*, 10(2).
- Li, T.M. (2014). *Land's End: Capitalist Relations on an Indigenous Frontier*. Durham, NC: Duke University Press.
- Lidström, S., Levin, L.A. & Seabrook, S. (2024). "Laying waste to the deep: parallel narratives of marine carbon dioxide removal and deep-seabed mining." *npj Ocean Sustainability* 3(1): 36.
- Lotulung, G. (2024). Nickel in Sulawesi: the price of a green economy. *Humanitarian Alternatives*, 25. <https://www.alternatives-humanitaires.org/en/2024/03/21/nickel-in-sulawesi-the-price-of-the-green-economy/>
- Maimunah, S. (2012). *Negara tambang dan masyarakat adat: perspektif HAM dalam pengelolaan pertambangan yang berbasis lingkungan & kearifan local (Mining State and Custom-*

- based Communities: A Human Rights Perspective on Managing Mining for the Environment and Local Wisdom*). Jakarta, Indonesia: InTrans Pub.
- Malm, A. (2016). Who lit this fire? Approaching the history of the fossil economy. *Critical Historical Studies*, 3(2), 215-248.
- Malm, A., & Carton, W. (2021). Seize the means of carbon removal: The political economy of direct air capture. *Historical Materialism*, 29(1), 3-48.
- Marley, B. (2016). The Coal Crisis in Appalachia: Agrarian Transformation, Commodity Frontiers and the Geographies of Capital. *Journal of Agrarian Change* 16(2), 225–254.
- Martin, F. (2017). Reimagining Extractivism: Insights from Spatial Theory, Ed. Dietz, K. and Engels, B. (eds). In *Contested Extractivism, Society and the State*, Palgrave Macmillan, 21-44.
- Martinez-Alier, J., & Walter, M. (2016). Social metabolism and conflicts over extractivism. *Environmental Governance in Latin America*, 58-85.
- Marx, K. (1867). *Capital: A Critique of Political Economy*, Vol. 1. <https://www.marxists.org/archive/marx/works/1867-c1/>
- Marx, K., & Engels, F. (1848). *Communist Manifesto (Chapter 1)*. <https://www.marxists.org/archive/marx/works/1848/communist-manifesto/ch01.htm>
- Mizwar, A. (2003). *Inco Untung, Pemerintah Buntung. [Inco Profits, Government Loses]*. Palu, Indonesia: Yayasan Tanah Merdeka [Free Earth Foundation].
- Moore, E. (2025, June 27). Nickel waste floods homes in Indonesia, sparking protests. Earthworks. <https://earthworks.org/blog/nickel-waste-floods-homes-in-indonesia-sparking-protests/>
- Mudd, G.M. (2010). Global trends and environmental issues in nickel mining: Sulfides versus laterites. *Ore Geology Reviews*, 38(1-2), 9-26.
- Müller, M., & Reckordt, M. (2017). Without responsibility and transparency. *Human rights risks along the nickel supply chain*. philippinenbüro e. V. and PowerShift. [https://sh.rosalux.de/fileadmin/rls\\_uploads/pdfs/Studien/2017\\_philippinenbuero\\_Nickel\\_ENG.pdf](https://sh.rosalux.de/fileadmin/rls_uploads/pdfs/Studien/2017_philippinenbuero_Nickel_ENG.pdf)
- Myers, R., Intarini, D., Sirait, M. T., & Maryudi, A. (2017). Claiming the forest: Inclusions and exclusions under Indonesia's 'new' forest policies on customary forests. *Land Use Policy*, 66, 205-213.
- Naryono, E. (2023). Nickel mine exploitation in Indonesia, between a blessing and a disaster of environmental damage. *Center for Open Science*, 1-22.
- Nasir, M., Bakker, L., & Van Meijl, T. (2022). Coal mining governance in Indonesia: Legal uncertainty and contestation. *Austl. J. Asian L.*, 22, 53.
- Nasution, M. J., Bakri, S., Setiawan, A., Wulandari, C., & Wahono, E. P. (2024). The Impact of Increasing Nickel Production on Forest and Environment in Indonesia: A Review. *Jurnal Sylva Lestari*, 12(3), 549-579.
- Neilson, J. (2020). Domein Verklaring: Colonial Legal Legacies and Community Access to Land in Indonesia. *Georgetown Journal of Affairs*. <https://gjia.georgetown.edu/2020/11/25/domein-verklaring-colonial-legal-legacies-and-community-access-to-land-in-indonesia/>
- Nevins, J., & Peluso, N.L. (Eds.). (2019). *Taking Southeast Asia to Market: Commodities, Nature, and People in the Neoliberal Age*. Cornell University Press.
- Nolin, C., & Russell, G. (Eds.). (2021). *Testimonio: Canadian Mining in the Aftermath of Genocides in Guatemala*. Between the Lines.

- Ong, A. (2006). *Neoliberalism as exception: Mutations in citizenship and sovereignty*. Duke University Press.
- Ordóñez, J. A., Jakob, M., Steckel, J. C., & Fünfgeld, A. (2022). Coal, power and coal-powered politics in Indonesia 1. In *The Political Economy of Coal* (pp. 281-299). Routledge.
- Panitch, L. & Gindin, S. (2012). *The making of global capitalism: the political economy of American empire*. London: Verso., p. 133.
- Patel, R., & Moore, J. W. (2017). *A history of the world in seven cheap things: A guide to capitalism, nature, and the future of the planet*. Univ of California Press.
- Priamarizki, A., & Hairpin, M. (2024). A most militarised cabinet. *new mandala*. <https://www.newmandala.org/a-most-militarised-cabinet/>
- Project Multatuli & Singgih, V. (2024). Cina di Hilir: Gurita Oligarki Nikel Indonesia. [China Downstream: Indonesia's Nickel Oligarchy Octopus]. Project Multatuli. <https://projectmultatuli.org/cina-di-hilir-gurita-oligarki-nikel-indonesia/>
- Quitow, R., Bersalli, G., Eicke, L., Jahn, J., Lilliestam, J., Lira, F., Marian, A., Süsser, D., Thapar, S., Weko, S., Williams, S. & Xue, B. (2021). The COVID-19 crisis deepens the gulf between leaders and laggards in the global energy transition. *Energy Research & Social Science*, 74, 101981.
- Rachman, N.F., & Siscawati, M. (2016). "Forestry Law, Masyarakat adat and struggles for inclusive citizenship in Indonesia." In *Routledge Handbook of Asian Law*, 224–249. London: Routledge.
- Resosudarmo, B.P. (Ed.). (2005). *The politics and economics of Indonesia's natural resources*. Institute of Southeast Asian Studies.
- Riyanto, G., Yeremia, A. E., Astuti, R., Zuada, L. H., Hidayat, A., & Rakhmani, I. (2025). Various visions of the industrialized future: anxiety, aspiration, and Chinese nickel investment in Indonesia. *Asia Europe Journal*, 1-23.
- Robinson, K.M. (1986). *Stepchildren of progress: The political economy of development in an Indonesian mining town*. State University of New York Press.
- Sangaji, A. (2007). The Masyarakat Adat movement in Indonesia: A critical insider's view. In: Davidson J.S., Henley, D. (eds). *The Revival of Tradition in Indonesian Politics: The Deployment of Adat from Colonialism to Indigenism*. London: Routledge, pp. 319–336.
- Sangadji, A. (2021). *State and Capital Accumulation: Mining Industry in Indonesia*. Doctoral Dissertation. York University. <http://hdl.handle.net/10315/38238>
- Sangadji A, Ngoyo M.F., & Ginting, P. (2019). Road to ruin: challenging the sustainability of nickel-based production for electric vehicle batteries. Rosa Luxemburg Stiftung. <https://www.rosalux.de/en/publication/id/44018/road-to-ruin>. Accessed 1 June 2024.
- Sultana, F. (2023). Whose growth in whose planetary boundaries? Decolonising planetary justice in the Anthropocene. *Geo: Geography and Environment*, 10(2), e00128.
- Tadjoeddin, M.Z., Yumna, A., Gultom, S.E., Rakhmadi, M.F., & Suryahadi, A. (2021). Inequality and violent conflict: new evidence from selected provinces in Post-Soeharto Indonesia. *Journal of the Asia Pacific Economy*, 26(3), 552-573.
- Tsing, A. (2002). Land as law: Negotiating the meaning of property in Indonesia. In: Richards J.F. (ed). *Land, Property, and the Environment*. Oakland, CA: Institute for Contemporary Studies Press, pp. 94–137.
- USGS. (2025). US Geological Survey 2025 Mineral Commodity Summary. <https://pubs.usgs.gov/periodicals/mcs2025/mcs2025-nickel.pdf>

- UNCTAD. (2020, November 2). "Omnibus Law" on job creation has been enacted. <https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3567/indonesia-omnibus-law-on-job-creation-has-been-enacted>
- Vale. (n.d.). Our people. <https://vale.com/indonesia/our-people>
- Vikström, H. (2020). Risk or opportunity? The extractive industries' response to critical metals in renewable energy technologies, 1980-2014. *The Extractive Industries and Society*, 7(1), 20-28.
- Von Rintelen, K., Arida, E., & Häuser, C. (2017). A review of biodiversity-related issues and challenges in megadiverse Indonesia and other Southeast Asian countries. *Research Ideas and Outcomes*, 3, e20860.
- Warburton, E. (2018). A new developmentalism in Indonesia?. *Journal of Southeast Asian Economies*, 35(3), 355-368.
- Wood, W.B. (1985). Intermediate Cities in the Resources Frontier: A Case Study of Samarinda and Balikpapan, East Kalimantan, Indonesia. *The University of Hawaii*, 63-70.
- Ye, J., van der Ploeg, J. D., Schneider, S., & Shanin, T. (2020). The incursions of extractivism: moving from dispersed places to global capitalism. *The Journal of Peasant Studies*, 47(1), 155-183.