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# The Political Economy of Indonesia's Nickel Downstreaming amid WTO Disputes and Industrial Transformation

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**Abstract:** This article examines Indonesia's nickel downstreaming policy within the interaction between global trade pressures, World Trade Organization (WTO) disputes, and domestic industrial transformation. The increasing global demand for nickel driven by the expansion of electric vehicle (EV) industries has positioned Indonesia as a strategic actor in the global mineral supply chain. However, Indonesia's export restrictions on raw nickel ore and downstream industrial policies have generated tensions within the international trade regime, particularly through the WTO dispute initiated by the European Union. Previous studies have generally focused either on global trade governance or domestic industrial policy separately, resulting in limited integrative analysis explaining how global trade pressure, institutional capacity, and political legitimacy simultaneously shape trade policy outcomes in developing countries.
**Purpose:** This study aims to analyze Indonesia's nickel downstreaming policy through an integrative political economy perspective that examines the interaction between global trade governance, domestic institutional dynamics, and political legitimacy in shaping industrial transformation.

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**Design/Methodology/Approach:** This research employs a qualitative approach using policy analysis and case study methods. Data were collected from government regulations, WTO dispute documents, trade reports, investment statistics, academic journals, and secondary empirical data related to Indonesia's nickel industry and downstream industrial development.
**Findings:** The study finds that Indonesia's downstreaming policy is shaped not only by global trade pressure and WTO regulations but also by domestic institutional capacity, industrial policy objectives, and economic nationalism. The policy contributed to increased processed nickel exports, industrial investment, and Indonesia's strategic position within the global EV supply chain despite international trade disputes and external pressure from developed countries.
**Originality/value:** This article contributes to the literature by developing an integrative analytical framework that explains how global trade governance, domestic institutional capacity, and political legitimacy interact in shaping industrial policy outcomes.
**Keywords:** political economy; nickel downstreaming; WTO disputes; industrial policy; economic nationalism
**Paper Type:** Article-research

## Introduction

The global transition toward renewable energy and electric vehicles (EVs) has accelerated international competition over critical minerals, particularly nickel, which has become an essential component in lithium-ion battery production and green industrial technologies. The rapid expansion of EV industries, renewable energy infrastructure, and battery manufacturing has significantly increased global demand for nickel and reshaped global supply chains for strategic minerals (Lee and Lim 2024; Dzakwan and Putri 2022). In recent years, critical minerals have no longer been viewed solely as economic commodities but also as strategic geopolitical resources closely connected to industrial

competitiveness, technological transformation, and energy security (Ramadhan and Siregar 2024).

Within this context, Indonesia has emerged as one of the most strategically important actors in the global nickel industry due to its large nickel reserves and expanding downstream industrial capacity. According to the United States Geological Survey (2024), Indonesia possesses approximately 22 percent of global nickel reserves, positioning the country as a dominant supplier in the international nickel market. This strategic position encouraged the Indonesian government to implement a downstreaming policy (hilirisasi) through restrictions on raw nickel ore exports and the expansion of domestic processing industries. The downstreaming agenda became increasingly prominent following the implementation of the nickel export ban in January 2020 as part of the government's broader industrial transformation strategy.

The Indonesian government argues that downstreaming policy is necessary to increase domestic value-added production, strengthen industrial competitiveness, reduce dependence on raw commodity exports, and support long-term economic transformation. Rather than functioning merely as a supplier of raw materials, Indonesia seeks to reposition itself within the global value chain through the development of smelter industries and integrated electric vehicle battery production. Recent studies suggest that Indonesia's downstreaming policy reflects broader efforts toward industrial upgrading, resource sovereignty, and green economic transition within the global EV supply chain (Ardiansyah and Widodo 2024; Sari and Kurniawan 2023). At the same time, the policy also illustrates the growing role of state intervention and industrial policy in developing countries seeking greater control over strategic natural resources (Harsono and Maulida 2023).

Empirically, Indonesia's downstreaming policy has contributed to substantial industrial and export growth. Before the implementation of export restrictions, Indonesia primarily exported raw nickel ore with limited domestic processing capacity. However, after the export ban policy was introduced, the value of Indonesia's processed nickel exports increased significantly from approximately USD 3.3 billion in 2017 to around USD 33.8 billion in 2022 (Financial Times 2023). The policy also stimulated rapid investment growth in smelter industries and industrial zones such as the Indonesia Morowali Industrial Park (IMIP) and Weda Bay Industrial Park, which developed into major centers of nickel processing and battery-related industries (Breakbulk 2023). This transformation demonstrates how downstream industrial policy can alter a country's position within the global political economy by increasing domestic industrial capacity and attracting foreign investment.

Nevertheless, Indonesia's downstreaming strategy has generated tensions within the international trade regime under the World Trade Organization (WTO). The European Union challenged Indonesia's export restrictions through WTO dispute case DS592 concerning measures relating to raw materials. The European Union argued that Indonesia's export ban violated Article XI:1 of the General Agreement on Tariffs and Trade (GATT) 1994 concerning quantitative restrictions on exports (World Trade Organization 2022). Several recent studies argue that Indonesia's export restrictions represent a significant challenge to contemporary global trade governance because the policy prioritizes domestic industrialization and resource sovereignty over liberal trade principles (Fitriani and Rifai 2023; Wibowo and Aisyah 2023). Despite the WTO ruling against Indonesia in 2022, the Indonesian government maintained its downstreaming agenda and appealed the decision, emphasizing

the importance of industrial independence and long-term national development.

The Indonesian case also demonstrates that contemporary industrial policy is increasingly influenced by geopolitical competition surrounding strategic resources and energy transition industries. In the global electric vehicle supply chain, control over critical minerals such as nickel has become closely connected to industrial security, technological competitiveness, and long-term economic influence. Consequently, downstreaming policy should not be viewed solely as a domestic economic strategy, but also as part of broader global competition among states seeking to secure strategic industrial resources and strengthen their position within emerging green industrial markets. This condition explains why Indonesia's downstreaming policy generated strong international responses despite its contribution to domestic industrial transformation.

Recent literature suggests that the rise of critical minerals has generated a new wave of resource nationalism characterized by export restrictions, downstream industrialization policies, and stronger state intervention aimed at capturing greater domestic value-added production. In this context, resource-rich countries increasingly seek to move beyond their traditional role as raw material exporters by developing domestic processing industries and strengthening industrial sovereignty (Lebdioui, 2025). Within the broader framework of International Political Economy (IPE), Indonesia's nickel downstreaming policy reflects the growing tension between global trade liberalization and domestic industrial policy in resource-rich developing countries.

Existing studies in IPE generally focus on the influence of international institutions, trade governance, and global economic interdependence on national policy autonomy (Gilpin 2001; O'Brien and Williams 2016). Meanwhile, institutional and public policy approaches emphasize state capacity, industrial

governance, and political negotiation processes in policy implementation (North 1990; Fischer, Miller, and Sidney 2006). However, previous studies often examine these dimensions separately and provide limited explanation regarding how global trade pressure, domestic institutional arrangements, and political legitimacy interact simultaneously in shaping Indonesia's downstreaming policy.

This study seeks to address this gap by developing an integrative political economy analysis that examines the interaction between global trade governance, domestic institutions, and political legitimacy. The article argues that Indonesia's downstreaming strategy cannot be understood merely as an economic policy or a trade restriction mechanism. Instead, the policy reflects the interaction between global trade structures, domestic institutional arrangements, industrial policy objectives, and political negotiation processes within Indonesia's national development agenda. Therefore, this study aims to analyze how global trade pressure, WTO disputes, and domestic institutional dynamics influence Indonesia's industrial transformation through nickel downstreaming policy.

Theoretically, this research contributes by developing an integrative analytical framework that connects global trade governance, domestic institutions, and political legitimacy within a single explanatory model. Empirically, this study contributes to understanding how resource-rich developing countries utilize strategic industrial policy to strengthen economic sovereignty and industrial competitiveness amid intensifying geopolitical competition and global economic restructuring in the renewable energy era.

Existing studies on Indonesia's nickel downstreaming generally focus on one analytical dimension. International Political Economy studies emphasize global trade governance and WTO disputes, institutional approaches focus on state capacity

and industrial policy implementation, while resource nationalism literature highlights sovereignty over strategic resources. These perspectives provide important insights but often treat these dimensions separately.

This study argues that industrial policy outcomes emerge from the interaction of these dimensions rather than from a single explanatory factor. The analytical contribution of this article, therefore, lies not in proposing a new theory but in demonstrating how global trade pressure, domestic institutional arrangements, and political legitimacy operate simultaneously and reinforce one another in shaping Indonesia's downstreaming strategy.

The findings suggest a paradoxical relationship between external trade pressure and domestic policy persistence. Rather than weakening Indonesia's downstreaming agenda, the WTO dispute increased political support for the policy by reinforcing narratives of economic sovereignty and industrial independence. This indicates that external pressure may strengthen policy legitimacy when political elites successfully frame international disputes as challenges to national development objectives. Therefore, the WTO dispute functioned not only as a legal constraint but also as a political resource that enhanced domestic support for industrial transformation.

**Methods**

This study employs a qualitative research approach using a case study design to analyze the political economy dynamics of Indonesia's nickel downstreaming policy. The qualitative approach was selected because the research focuses on understanding the interaction between global trade pressure, domestic institutional arrangements, and political policy processes within Indonesia's industrial transformation strategy. The case study method enables an in-depth examination of Indonesia's downstreaming policy as a contemporary trade policy

issue situated within the broader framework of International Political Economy (IPE).

The primary focus of this study consists of three analytical dimensions: global trade pressure, domestic institutional dynamics, and political legitimacy in Indonesia's nickel downstreaming policy. These dimensions function as the main analytical framework for examining how international trade governance, state intervention, and political processes interact in shaping industrial transformation. The unit of analysis in this study is Indonesia's nickel downstreaming policy following the implementation of the raw nickel ore export ban and the subsequent WTO dispute with the European Union.

The study specifically focuses on Indonesia's nickel downstreaming policy following the implementation of the raw nickel ore export ban in January 2020 and the subsequent World Trade Organization (WTO) dispute with the European Union under dispute case DS592 concerning measures relating to raw materials. This case was selected because it represents one of the most significant examples of the tension between global trade liberalization and domestic industrial policy in resource-rich developing countries. In addition, the policy has become strategically important due to the increasing global demand for nickel in electric vehicle (EV) battery industries and renewable energy supply chains.

This research utilizes secondary data obtained from multiple sources to strengthen empirical analysis and ensure data triangulation. The primary sources include official government regulations, WTO dispute documents, Ministry of Energy and Mineral Resources reports, Ministry of Trade publications, investment reports from the Indonesia Investment Coordinating Board (BKPM), statistical data from Badan Pusat Statistik (BPS), World Bank reports, OECD publications, and international trade reports. The study also incorporates academic journal articles and

previous studies related to trade policy, downstream industrialization, global supply chains, economic nationalism, and resource governance. Empirical data concerning Indonesia's processed nickel exports, smelter investment growth, industrial development, and downstream policy implementation were analyzed to evaluate the economic and political impact of the downstreaming strategy.

The data collection process was conducted through document analysis and literature review. Government regulations analyzed in this study include Law Number 4 of 2009 concerning Mineral and Coal Mining, Law Number 3 of 2014 concerning Industry, and regulations related to export restrictions and downstream industrial policy. WTO dispute reports and international trade publications were examined to understand the global trade governance dimension and the international response toward Indonesia's export ban policy.

Data analysis was conducted using qualitative content analysis and thematic analysis. The analytical process involved identifying patterns, relationships, and interactions between global trade pressure, institutional capacity, industrial policy objectives, and political legitimacy. This study adopts an integrative political economy framework consisting of three analytical dimensions: the global level, the institutional level, and the political level. This framework enables the study to explain how international trade disputes, domestic institutional arrangements, and political interests interact simultaneously in shaping Indonesia's nickel downstreaming policy.

To strengthen analytical validity and reliability, this study applies source triangulation by comparing information from government documents, international institutions, academic literature, statistical reports, and policy analyses. This approach allows the research to provide a more comprehensive understanding of Indonesia's contemporary industrial

transformation and trade policy trajectory within the global political economy.

## Discussion and Findings

### Global Trade Pressure and Indonesia's Downstreaming Strategy

Indonesia's nickel downstreaming policy emerged within a period of major transformation in the global economy, particularly following the rapid expansion of electric vehicle (EV) industries and renewable energy technologies. The increasing global demand for nickel has significantly altered the strategic position of resource-rich countries within international trade and industrial supply chains. Nickel is no longer viewed merely as a mining commodity but as a strategic mineral closely associated with energy transition, technological competition, and industrial security.

The growing importance of nickel is closely linked to intensifying geopolitical competition among major economic powers seeking to secure critical mineral supply chains for electric vehicle batteries, renewable energy technologies, and advanced manufacturing industries. China currently dominates the global battery supply chain through its control over mineral processing, battery component manufacturing, and electric vehicle production, while the United States and the European Union have increasingly adopted industrial policies aimed at reducing dependence on Chinese-controlled supply chains and securing alternative sources of critical minerals (International Energy Agency 2024; European Commission 2024). Within this context, Indonesia's large nickel reserves, accounting for approximately 22 percent of global reserves, have positioned the country as a strategically important actor within the emerging global green industrial economy (United States Geological Survey 2024).

According to Lee and Lim (2024), critical minerals have become increasingly intertwined with geopolitical competition,

supply-chain security, and industrial resilience strategies. Consequently, resource governance is no longer viewed solely through an economic lens but also as a strategic component of national industrial security and technological competitiveness. However, Indonesia's downstreaming policy should not be understood solely as a national industrialization strategy.

Rather, it represents an effort to strengthen Indonesia's bargaining position within a global battery supply chain largely dominated by Chinese industrial capital and technology. Major downstream industrial zones such as Indonesia Morowali Industrial Park (IMIP) and Weda Bay Industrial Park have attracted substantial investment from Chinese corporations including Tsingshan Holding Group, CATL, Huayou Cobalt, GEM Co., Ltd., and CNGR Advanced Material, which play central roles in nickel processing, battery precursor production, and EV-related manufacturing activities (Prasetyo and Febriani 2023; International Energy Agency 2024). Consequently, Indonesia's industrial transformation has become deeply embedded within broader geopolitical competition over critical minerals and strategic industrial supply chains. As a result, Indonesia occupies a dual position within the contemporary global political economy: as an emerging industrial actor seeking greater value-added production and industrial sovereignty, while simultaneously serving as a strategic supplier of critical minerals required for the global energy transition.

At the same time, the increasing global demand for nickel has generated important ecological and social contradictions. While nickel is promoted as a critical resource supporting the transition toward low-carbon technologies, the expansion of mining activities and downstream processing industries has also intensified deforestation, biodiversity loss, coastal ecosystem degradation, water pollution, and carbon-intensive industrial production in several nickel-producing regions such as Morowali,

Konawe, and Halmahera (Harsono and Maulida 2023; Sovacool et al. 2020). These environmental impacts indicate that industrial transformation within the green economy is not free from ecological costs, particularly in resource-rich regions where extractive activities continue to intensify.

From a political economy perspective, this condition reflects a broader contradiction within the global energy transition agenda. Although nickel is promoted as a critical mineral necessary for electric vehicle batteries and renewable energy technologies, its extraction frequently reproduces environmentally intensive forms of resource exploitation. Recent studies argue that the transition toward low-carbon technologies requires massive quantities of strategic minerals while simultaneously generating new environmental and social pressures in extraction sites (Sovacool et al. 2020). Consequently, the transition toward a greener global economy may not necessarily eliminate ecological destruction but instead relocate environmental burdens toward mineral-producing regions in developing countries.

Furthermore, downstream industrial expansion has also generated tensions involving indigenous peoples and local communities. The expansion of mining concessions, industrial estates, and supporting infrastructure has altered traditional land-use systems and reduced community access to natural resources in several mining regions. In this context, scholars increasingly describe the phenomenon as *green extractivism*, referring to situations in which policies designed to support low-carbon transitions simultaneously reproduce new forms of resource extraction, environmental degradation, and unequal development in the Global South (Arsel, Hogenboom, and Pellegrini 2016; Riofrancos 2023). Riofrancos (2023) argues that the global competition for critical minerals has intensified extractive frontiers while much of the technological and economic value

remains concentrated within transnational industrial networks. As a result, resource-rich developing countries frequently bear disproportionate environmental and social costs associated with supplying strategic minerals for global industries.

**Table 1**. Selected Empirical Evidence of Socio-Environmental Challenges in Indonesia's Nickel Industrial Regions

| Region | Empirical Evidence | Reported Implications |
|---|---|---|
| Morowali (Central Sulawesi) | Multiple workplace accidents were reported in nickel smelter operations, including a major explosion at a nickel processing facility in December 2023 that resulted in fatalities and injuries. Labor protests concerning wages, occupational safety, and working conditions have also occurred within industrial zones. | Workplace safety concerns, labor disputes, and governance challenges in rapidly expanding industrial estates. |
| Weda Bay (North Maluku) | Expansion of nickel mining and smelter activities has been associated with forest loss, land-use change, and community concerns regarding environmental degradation and access to traditional livelihoods. | Ecological pressure, community grievances, and tensions between industrial expansion and environmental sustainability. |
| Konawe (Southeast Sulawesi) | Increased mining and downstream industrial activities have generated concerns regarding coastal ecosystem degradation and | Environmental management challenges and uneven local development outcomes. |

| Region | Empirical Evidence | Reported Implications |
|---|---|---|
| | land-use conflicts in surrounding communities. | |

Source: Climate Rights International (2024); EITI (2023); WALHI Central Sulawesi (2023); WALHI North Maluku (2023); Ministry of Energy and Mineral Resources (2023).

According to Climate Rights International (2024), the rapid expansion of nickel processing facilities in Morowali has been associated with occupational safety concerns and environmental risks. EITI (2023) also reports increasing governance challenges related to community engagement and local development in North Morowali. Evidence from Morowali and Weda Bay illustrates the socio-environmental trade-offs associated with rapid downstream industrialization.

In Morowali, industrial expansion has been accompanied by labor disputes and workplace safety incidents, including a major smelter explosion in 2023 that highlighted concerns regarding occupational safety standards within nickel processing facilities. Meanwhile, in Weda Bay, the expansion of mining concessions and smelter operations has generated environmental concerns related to deforestation, land-use change, and community access to natural resources. These developments suggest that while downstream industrialization has contributed significantly to export growth and investment inflows, it has simultaneously increased governance challenges related to environmental sustainability, labor protection, and local socio-economic inclusion.

These findings indicate that the benefits and costs of downstream industrialization are distributed unevenly across actors and regions. While the state and industrial investors benefit from increased exports, investment, and industrial upgrading, local communities frequently bear a disproportionate share of

environmental and social risks. This pattern demonstrates that industrial transformation is not merely an economic process but also a political process involving competing interests, unequal power relations, and governance challenges.

**Table 2**. Major Actors and Strategic Interests in the Global Nickel Supply Chain

| **Actor** | **Strategic Interest** | **Position in the Global Nickel Supply Chain** |
|---|---|---|
| China | Maintain dominance in EV battery and clean technology industries | Dominates nickel processing, battery materials, and EV manufacturing |
| United States | Reduce dependence on Chinese-controlled supply chains | Expanding critical mineral partnerships and domestic battery production |
| European Union | Secure raw materials for the green industrial transition | Major importer and consumer of nickel-based products |
| Indonesia | Increase domestic value-added production and industrial upgrading | Largest nickel reserve holder and major producer |
| Chinese Corporations (Tsingshan, CATL, Huayou, GEM, CNGR) | Expand investment in nickel processing and battery production | Major investors in Indonesian downstream industries |

Source: International Energy Agency (2024); European Commission (2024); United States Geological Survey (2024); Prasetyo and Febriani (2023).

**Table 3**. Economic Benefits and Ecological-Social Challenges of Indonesia's Nickel Downstreaming Policy

| Dimension | Positive Outcomes | Emerging Challenges |
|---|---|---|
| Industrial Development | Expansion of smelter industries and downstream manufacturing facilities | Increased environmental pressure in mining and industrial zones |
| Export Performance | Processed nickel exports increased from USD 3.3 billion (2017) to USD 33.8 billion (2022) | Dependence on extractive industries remains high |
| Foreign Investment | Significant inflows of foreign direct investment, particularly in Morowali and Weda Bay industrial parks | Growing dependence on foreign capital, technology, and infrastructure |
| Employment Opportunities | Creation of new industrial and manufacturing jobs | Labor disputes, workplace safety concerns, and unequal employment benefits |
| Green Energy Transition | Strengthened Indonesia's position within the global EV battery supply chain | Deforestation, biodiversity loss, pollution, and carbon-intensive smelter operations |
| Local Development | Infrastructure and industrial growth in resource-rich regions | Community displacement, indigenous land conflicts, and uneven distribution of economic benefits |

Source: Financial Times (2023); Ministry of Energy and Mineral Resources of Indonesia (2023); Harsono and Maulida (2023); Sovacool et al. (2020); Riofrancos (2023).

The evidence presented in Tables 2 and 3 demonstrates that Indonesia's nickel downstreaming policy generates both substantial economic opportunities and significant ecological-social challenges. While the policy has strengthened industrial capacity, export performance, and participation in global battery supply chains, it has also intensified environmental degradation and social tensions in several mining regions. Therefore, Indonesia's downstreaming policy should not be understood merely as a successful industrial upgrading strategy but also as a contested political-economic process involving trade-offs between industrial growth, geopolitical competition, environmental protection, and social justice. The Indonesian case demonstrates that the long-term sustainability of industrial policy depends not only on increasing domestic value-added production and attracting investment, but also on the state's capacity to strengthen environmental governance, protect indigenous and local community rights, and ensure a more equitable distribution of industrial benefits across resource-rich regions.

**Domestic Institutions and Industrial Transformation**

At the domestic level, Indonesia's downstreaming policy was strongly influenced by institutional arrangements, regulatory intervention, and state-led industrial strategies. The government established legal and policy frameworks supporting downstream industrialization through Law Number 4 of 2009 concerning Mineral and Coal Mining and Law Number 3 of 2014 concerning Industry. These regulations emphasized the importance of increasing domestic processing capacity and reducing dependence on raw commodity exports.

The findings demonstrate that institutional support played a crucial role in accelerating industrial transformation. The

government actively promoted smelter development, industrial zones, and integrated processing industries connected to the electric vehicle battery ecosystem. Industrial areas such as the Indonesia Morowali Industrial Park (IMIP) and Weda Bay Industrial Park experienced rapid expansion following the implementation of export restrictions. These industrial zones attracted substantial foreign direct investment, particularly from Chinese companies involved in nickel processing, stainless steel production, and battery manufacturing industries.

**Table 4**. Domestic Institutional Support for Nickel Downstreaming Policy

| No | Policy Instrument | Main Objective | Institutional Impact |
|---|---|---|---|
| 1 | Law No. 4/2009 on Mineral and Coal Mining | Increase domestic processing | Export restriction implementation |
| 2 | Law No. 3/2014 on Industry | Promote industrialization | Industrial development support |
| 3 | Smelter Development Policy | Expand downstream industries | Investment growth |
| 4 | EV Battery Industry Strategy | Strengthen industrial competitiveness | Integration into global EV supply chain |

Source: Compiled by the author based on Law No. 4/2009 on Mineral and Coal Mining and Law No. 3/2014 on Industry.

The rapid development of downstream industries indicates that the state continues to play an important role in shaping industrial transformation in developing countries. Contrary to neoliberal assumptions emphasizing minimal state intervention, Indonesia's experience demonstrates that industrial policy, institutional coordination, and regulatory intervention remain

central components of economic restructuring strategies. Several studies also indicate that downstreaming policy contributed to increased foreign investment inflows and strengthened Indonesia's industrial competitiveness within the global supply chain (Prasetyo and Febriani 2023; Nugraha and Rahmawati 2022).

Furthermore, recent studies emphasize that state intervention and resource governance became increasingly important in managing Indonesia's downstream industrial expansion (Harsono and Maulida 2023). The government not only regulated export activities but also actively coordinated industrial licensing, infrastructure development, and strategic investment partnerships. This finding suggests that institutional capacity and state coordination significantly influence the effectiveness of industrial transformation policies in resource-rich developing countries.

Despite its industrial achievements, Indonesia's nickel downstreaming policy also generates several structural challenges that require critical attention. Rapid industrial expansion in major nickel-producing regions has increased environmental pressure through deforestation, mining waste, water pollution, and high carbon emissions generated by coal-based smelter operations. In addition, labor-related issues such as workplace safety, wage inequality, and tensions between local and foreign workers have emerged in several industrial areas.

The downstreaming strategy has also strengthened Indonesia's dependence on foreign investment, particularly from Chinese corporations that dominate smelter financing, technology, and industrial infrastructure development. While the influx of foreign capital has accelerated industrial expansion and increased processing capacity, the financing structure of many downstream projects reveals a more complex political economy dynamic. Major industrial zones such as Indonesia Morowali

Industrial Park (IMIP) and Weda Bay Industrial Park have been developed largely through Chinese investment, technology, engineering expertise, and integrated industrial networks, creating a situation in which Indonesia's downstream industrial growth remains closely linked to external sources of capital and technological capability (Prasetyo and Febriani 2023; International Energy Agency 2024).

From the perspective of Dependency Theory, this condition raises important questions regarding the nature of industrial transformation in resource-rich developing countries. Classical dependency scholars argue that economic development in peripheral countries often occurs through forms of integration into global capitalism that reproduce structural dependence on external actors rather than generating autonomous development (Cardoso and Faletto 1979; Dos Santos 1970). In the Indonesian case, downstream industrialization may represent a transformation of dependency rather than its elimination. Whereas Indonesia previously relied on exporting raw nickel ore to international markets, the country now increasingly depends on foreign investment, imported technology, and transnational industrial networks to sustain downstream production and participation in the global battery supply chain.

Furthermore, technology transfer—one of the primary objectives of downstream industrial policy—remains relatively limited in several strategic sectors. Although foreign investment has contributed to industrial upgrading and infrastructure development, key technologies, production processes, and managerial expertise continue to be concentrated within foreign corporations. As a result, domestic firms often occupy subordinate positions within production networks dominated by multinational enterprises. This situation creates the risk of what contemporary political economy scholars describe as resource-based industrial dependency, whereby domestic industrial

growth occurs without corresponding gains in technological autonomy and national industrial control (Evans 1979; Gallagher 2022).

Table 5 illustrates the shift from traditional commodity dependency toward a more complex form of industrial dependency within Indonesia's downstream sector.

**Table 5**. Transformation of Dependency in Indonesia's Nickel Industry

| **Dimension** | **Pre-Downstreaming Period** | **Downstreaming Period** |
|---|---|---|
| Main Export | Raw nickel ore | Processed nickel and battery materials |
| Source of Revenue | Commodity exports | Industrial exports and FDI-driven production |
| Foreign Involvement | International commodity buyers | Foreign investors, technology providers, and industrial operators |
| Strategic Dependency | Dependence on commodity markets | Dependence on foreign capital and technology |
| Domestic Value Added | Relatively low | Higher but unevenly distributed |
| Industrial Sovereignty | Limited processing capacity | Expanded processing capacity but continued technological dependence |

**Source:** Adapted from Cardoso and Faletto (1979); Dos Santos (1970); Prasetyo and Febriani (2023); International Energy Agency (2024).

Consequently, the long-term sustainability of Indonesia's downstreaming strategy depends not only on attracting foreign investment and increasing export performance but also on strengthening domestic technological capabilities, promoting

meaningful technology transfer, and expanding national participation within strategic industrial sectors. Without such measures, downstream industrialization risks becoming a new form of dependency in which resource-based exports are replaced by dependence on foreign capital, technology, and industrial governance structures. Therefore, the challenge for Indonesia is not merely to move up the value chain but to ensure that industrial upgrading contributes to greater technological autonomy and long-term industrial sovereignty.

Nevertheless, the downstreaming policy also generated several domestic challenges. Rapid industrial expansion increased environmental pressure, labor issues, uneven regional development, and dependence on foreign investment. In several industrial regions, accelerated industrialization produced social and environmental consequences that raised questions regarding the sustainability of downstream industrial development. Therefore, although downstreaming policy contributed to industrial growth, the findings indicate that long-term policy success depends on institutional effectiveness, environmental governance, and the state's ability to regulate industrial expansion sustainably.

These findings demonstrate that the effectiveness of Indonesia's downstreaming policy depends not only on the state's ability to attract investment and expand industrial capacity, but also on its institutional capability to manage the social, environmental, and political consequences of rapid industrial transformation. In this regard, downstream industrialization should not be understood merely as an export-oriented economic strategy, but as a long-term governance challenge requiring stronger regulatory coordination, sustainable resource management, and balanced distribution of industrial benefits across national and regional levels. The Indonesian case, therefore, illustrates that industrial transformation in developing countries

involves not only economic restructuring, but also continuous negotiation between growth objectives, environmental sustainability, and domestic political legitimacy.

Recent debates within political economy literature reveal competing interpretations regarding the role of downstream industrial policy in resource-rich developing countries. On the other hand, critical political economy scholars question whether downstream industrialization necessarily reduces structural dependence. Drawing on dependency theory and global production network approaches, these scholars argue that industrial upgrading often occurs within asymmetrical structures of global capitalism in which technology, finance, and strategic decision-making remain concentrated in advanced economies and multinational corporations (Evans 1979; Gallagher 2022). Consequently, resource-rich countries may achieve higher levels of domestic processing while continuing to depend on foreign capital, imported technology, and transnational industrial networks. In this interpretation, downstream industrialization may transform the form of dependency rather than eliminate it.

A similar debate emerges within discussions surrounding the global energy transition. However, scholars associated with political ecology and green extractivism argue that the transition to low-carbon technologies simultaneously expands extractive frontiers, intensifies environmental pressures, and reproduces unequal ecological relations between resource-producing regions and industrial centers of consumption (Arsel, Hogenboom, and Pellegrini 2016; Riofrancos 2023; Sovacool et al. 2020). From this perspective, green industrialization may generate economic gains while also creating new forms of ecological sacrifice and socio-environmental inequality.

This study positions itself between these competing perspectives. The findings suggest that Indonesia's downstreaming policy cannot be understood solely as either a

successful industrial upgrading strategy or a new form of dependency. Rather, the policy reflects a complex political economy process in which efforts to strengthen industrial sovereignty, increase domestic value-added production, and improve bargaining power within the global battery supply chain coexist with continued dependence on foreign investment, technological asymmetries, and growing ecological pressures. Therefore, Indonesia's experience demonstrates that downstream industrialization simultaneously creates opportunities for industrial transformation while generating new political, environmental, and developmental challenges that remain deeply embedded within the structures of contemporary global capitalism.

Moreover, recent political economy studies also emphasize that the effectiveness of downstream industrialization depends heavily on institutional quality and the state's ability to manage the social and environmental consequences of rapid industrial expansion. Therefore, the Indonesian case demonstrates that successful industrial transformation requires not only strong industrial policy and investment coordination but also long-term institutional capacity to regulate environmental sustainability, labor protection, and equitable distribution of industrial benefits within resource-rich regions.

**Economic Nationalism and Political Legitimacy**

Indonesia's downstreaming policy also reflects the growing influence of economic nationalism within contemporary trade and industrial policy. However, economic nationalism in the Indonesian case should not be understood merely as a political label or protectionist orientation. Rather, it combines elements of developmental nationalism**,** resource nationalism, and a broader discourse of economic sovereignty.

Developmental nationalism is reflected in the state's effort to utilize industrial policy and export restrictions to accelerate

domestic industrial upgrading and strengthen participation in higher value-added production networks. At the same time, resource nationalism is evident in the government's attempt to increase national control over strategic mineral resources and reduce dependence on Indonesia's traditional role as a raw material exporter. These objectives are closely connected to a broader discourse of economic sovereignty emphasizing the right of developing countries to determine their own industrial trajectories despite pressures from international trade regimes and global market actors (Gilpin 2001; Helleiner 2002; Susilo and Rahman 2024).

Recent studies further indicate that strategic competition over critical minerals has encouraged many governments to adopt more interventionist industrial policies aimed at securing supply chains and strengthening economic security. In this regard, industrial policy has re-emerged as a central instrument of state strategy in the context of great-power competition and the global energy transition (SIPRI, 2024). Political discourse surrounding downstreaming consistently emphasized resource sovereignty, industrial independence, and national economic transformation.

Government officials frequently argued that Indonesia should no longer remain dependent on raw commodity exports while industrialized countries capture most of the value-added benefits from mineral processing industries. Within this narrative, nickel was framed not merely as a commodity but as a strategic national asset whose processing should generate greater domestic economic benefits. Such narratives became important political instruments for linking industrial policy objectives with broader aspirations for national development and economic self-determination.

This political narrative became increasingly prominent following the WTO dispute with the European Union. However, the strengthening of political legitimacy surrounding

downstreaming policy should not be understood simply as a spontaneous public response to international criticism. Rather, legitimacy was actively constructed through political discourse, state institutions, bureaucratic communication, and media narratives that framed downstreaming as a struggle for national sovereignty and economic independence. Within this discourse, the WTO dispute was frequently portrayed not merely as a legal trade disagreement but as evidence of unequal global economic structures that continued to position developing countries primarily as suppliers of raw materials while advanced economies captured higher value-added benefits from industrial production.

Government officials, political elites, and state institutions consistently promoted narratives emphasizing national control over strategic resources, industrial sovereignty, and the right of Indonesia to pursue an independent development trajectory. Public statements surrounding the nickel export ban frequently invoked themes of economic self-reliance and resistance to external pressure, portraying downstreaming as a national mission to prevent Indonesia from remaining trapped within subordinate positions in global commodity chains. In this context, narratives such as protecting national resources, strengthening economic sovereignty, and avoiding renewed forms of foreign domination became important mechanisms for mobilizing public support and legitimizing continued state intervention in the mining sector.

From a political economy perspective, legitimacy was constructed not only through economic performance but also through narratives linking downstreaming to national identity, historical experiences of dependency, and aspirations for economic sovereignty (Crane 1998; Helleiner 2002). Consequently, support for downstreaming was strengthened not only through promises of industrial upgrading but also through symbolic appeals to nationalism and national development. Nevertheless,

political legitimacy surrounding downstreaming remains contested rather than universally accepted.

Environmental organizations, labor groups, indigenous communities, and civil society actors have raised concerns regarding ecological degradation, land conflicts, labor conditions, and the unequal distribution of economic benefits associated with rapid industrial expansion (Harsono and Maulida 2023; Riofrancos 2023). Critics argue that narratives of industrial sovereignty and economic nationalism may sometimes obscure environmental costs and marginalize alternative perspectives regarding sustainable development. Therefore, political legitimacy in the context of downstreaming should be understood not as a fixed condition or national consensus, but as an ongoing process of negotiation and contestation among state institutions, business actors, local communities, and civil society organizations.

The findings therefore suggest that economic nationalism became an important source of political legitimacy supporting Indonesia's downstream industrial policy. Rather than emerging automatically in response to external pressure, political legitimacy was constructed through narratives of economic sovereignty, industrial transformation, and national development promoted by state actors and institutions. In this regard, political legitimacy functions as a critical mediating mechanism between global trade pressure and domestic industrial policy. While WTO disputes and international criticism generated external constraints on Indonesia's downstreaming agenda, economic nationalism enabled state actors to transform these challenges into sources of domestic political support. Consequently, downstreaming outcomes were shaped not only by global economic structures and institutional capacity but also by the state's ability to construct and maintain legitimacy around industrial transformation.

The interaction between global trade pressure, domestic institutional arrangements, and political legitimacy in Indonesia's downstreaming policy can be illustrated through the following multi-level political economy framework. The framework demonstrates how external trade governance structures, particularly WTO regulations and international market dynamics, interact with domestic institutional capacity, industrial policy intervention, and political processes in shaping Indonesia's industrial transformation strategy. It also explains that downstreaming policy outcomes are not determined solely by global economic pressure, but are simultaneously influenced by state capacity, economic nationalism, and political legitimacy within the national development agenda. In addition, the framework highlights that industrial transformation in developing countries is increasingly shaped by the strategic competition over critical minerals within the global energy transition era. Therefore, Indonesia's downstreaming policy reflects not only an economic development strategy, but also a political response to unequal structures within contemporary global trade and industrial governance.

**Table 6**. Comparison between Existing Political Economy Approaches and the Proposed Analytical Framework

| **Approach** | **Main Focus** | **Limitation** | **Contribution of This Study** |
|---|---|---|---|
| International Political Economy | Global trade governance and state-market relations | Limited attention to domestic legitimacy formation | Integrates global trade pressure with domestic political legitimacy |
| Institutionalism | Role of institutions in policy outcomes | Often underestimates geopolitical competition | Incorporates strategic competition |

| Approach | Main Focus | Limitation | Contribution of This Study |
|---|---|---|---|
| | | | over critical minerals |
| Resource Nationalism | State control over natural resources | Focuses mainly on resource sovereignty | Connects resource nationalism with industrial transformation and WTO disputes |
| Political Ecology | Environmental and social consequences of extraction | Limited attention to industrial policy dynamics | Integrates ecological tensions within industrial upgrading strategies |

Source: Compiled by the author based on Indonesia Extractive Industries Transparency Initiative (EITI) (2023), Climate Rights International (2024), International Institute for Sustainable Development (IISD) (2025), and secondary studies on nickel industrialization in Morowali and Weda Bay.

Rather than proposing an entirely new theory, this study develops an integrative analytical framework that connects global trade governance, domestic institutional capacity, economic nationalism, and political legitimacy within a single explanatory model. The contribution of the framework lies in explaining how these dimensions interact in shaping industrial transformation outcomes in resource-rich developing countries.

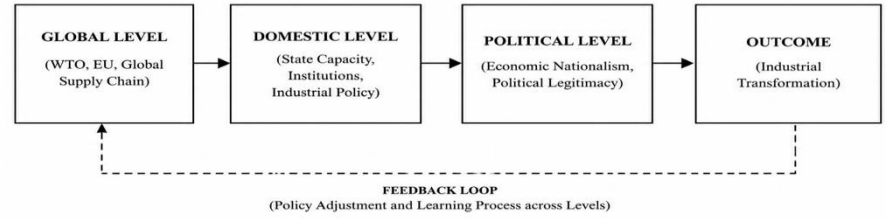


Figure 1. Analytical Framework of Indonesia's Nickel Downstreaming Policy
Source: Developed by the author based on Gilpin (2001), O'Brien and Williams (2016), North (1990), WTO reports (2022), and empirical findings of Indonesia's nickel downstreaming policy.

The figure illustrates that Indonesia's downstreaming policy emerged through the interaction between global trade pressure, domestic institutional arrangements, and political negotiation processes. At the macro level, global trade governance and WTO rules generated external pressure on Indonesia's industrial policy. At the meso level, domestic institutions mediated these pressures through industrial regulations, investment coordination, and downstream development strategies. At the micro level, political legitimacy and economic nationalism strengthened domestic support for industrial transformation policies.

The findings demonstrate that Indonesia's nickel downstreaming policy represents a broader political economy strategy rather than merely a trade restriction policy. The policy reflects Indonesia's effort to restructure its position within the global economy by strengthening industrial capacity, increasing domestic value-added production, and expanding participation within strategic industrial supply chains. The interaction between global trade governance, domestic institutions, and political

legitimacy ultimately shapes Indonesia's contemporary industrial transformation trajectory within the global political economy.

The findings also indicate that Indonesia's downstreaming strategy reflects the changing character of contemporary industrial policy in developing countries amid intensifying geopolitical and economic competition. In recent years, strategic minerals such as nickel have become increasingly associated with national industrial security, energy transition agendas, and global technological competition. As a result, developing countries possessing strategic natural resources are no longer positioned merely as commodity suppliers within the international economic system, but increasingly attempt to strengthen domestic industrial control and expand participation in higher value-added production networks. In this context, Indonesia's downstreaming policy illustrates how industrial policy and resource governance are being redefined as strategic political economy instruments within the contemporary global order.

At the same time, the Indonesian case demonstrates that industrial transformation policies inevitably involve continuous negotiation between economic growth objectives, international trade commitments, and domestic political legitimacy. Although downstreaming policy contributed significantly to export growth and industrial expansion, the findings suggest that long-term industrial sustainability depends on the state's institutional capacity to regulate environmental impacts, manage foreign investment dependence, and ensure more equitable distribution of industrial benefits across local communities. Therefore, the effectiveness of downstream industrialization should not be measured solely through export performance and investment growth, but also through the government's ability to balance industrial competitiveness with sustainable governance and social inclusion within resource-rich regions.

The findings can also be understood within the broader context of Indonesia's long-term industrial transformation agenda under Law Number 3 of 2014 concerning Industry and Law Number 4 of 2009 concerning Mineral and Coal Mining, which emphasize domestic processing obligations and national industrial strengthening. Through these regulatory frameworks, the Indonesian government attempted to reposition the country from a primary commodity exporter toward a higher value-added industrial producer within the global supply chain. Empirical evidence demonstrates that this strategy generated significant industrial expansion following the implementation of the nickel export ban in 2020. According to data from the Ministry of Energy and Mineral Resources (2023), the number of operational nickel smelters increased substantially during the downstreaming period, while processed nickel export value rose from approximately USD 3.3 billion in 2017 to around USD 33.8 billion in 2022 (Financial Times 2023). Several recent studies also argue that downstream industrialization strengthened Indonesia's bargaining position within the global electric vehicle battery industry and increased foreign investment inflows into strategic industrial zones such as IMIP and Weda Bay (Prasetyo and Febriani 2023; Ardiansyah and Widodo 2024). These developments indicate that industrial policy intervention continues to play an important role in shaping economic restructuring and industrial upgrading in developing countries.

At the same time, the Indonesian case demonstrates that industrial transformation policies remain deeply embedded within political and institutional negotiation processes. Although downstreaming policy contributed significantly to export growth and industrial expansion, the policy also generated structural tensions related to environmental governance, labor conditions, and foreign investment dependence. Recent studies suggest that rapid downstream industrial expansion in resource-rich

developing countries frequently creates governance challenges associated with regulatory capacity, environmental sustainability, and unequal distribution of industrial benefits (Susilo and Rahman 2024; Harsono and Maulida 2023). In Indonesia's downstreaming sector, industrial growth remains highly concentrated in specific regions such as Morowali and Halmahera, while local communities continue to face environmental pressure and limited socio-economic inclusion. Furthermore, the increasing dominance of Chinese investment in smelter financing, technology, and industrial infrastructure development raises concerns regarding long-term industrial sovereignty and domestic technological dependence. Therefore, the Indonesian experience illustrates that successful downstream industrialization depends not only on export performance and investment growth, but also on the state's institutional capacity to balance industrial competitiveness, environmental governance, and equitable socio-economic development within resource-rich regions.

This study has several limitations that should be acknowledged. First, the research relies primarily on secondary data and policy documents, which may limit the depth of analysis regarding policy implementation at the local level. Second, the study focuses mainly on political economy dynamics surrounding Indonesia's nickel downstreaming policy and does not extensively examine environmental governance or labor conditions through field-based investigation. Future research may strengthen the analysis by incorporating interviews, stakeholder perspectives, and comparative studies involving other resource-rich developing countries implementing similar industrial policies.

**Table 7**. Economic Gains and Governance Challenges of Indonesia's Nickel Downstreaming Policy

| Dimension | Evidence |
|---|---|
| Export Growth | Processed nickel exports increased from approximately USD 3.3 billion (2017) to USD 33.8 billion (2022). |
| Industrial Investment | Rapid expansion of Indonesia Morowali Industrial Park (IMIP) and Weda Bay Industrial Park as major nickel processing and battery-industry hubs. |
| Employment | Significant growth in industrial employment opportunities within downstream processing zones. |
| Labor Issues | Workplace accidents, labor disputes, and occupational safety concerns reported in several nickel industrial areas. |
| Environmental Impacts | Deforestation, pollution, biodiversity loss, and ecological degradation associated with mining and smelter expansion. |
| Governance Challenges | Balancing industrial competitiveness, environmental sustainability, labor protection, and equitable regional development. |

Source: Compiled by the author based on Financial Times (2023), Ministry of Energy and Mineral Resources of Indonesia (2023), Extractive Industries Transparency Initiative (EITI) (2023), Climate Rights International (2024), International Energy Agency (2024), Riofrancos (2023), and Sovacool et al. (2020).

## Conclusion

Indonesia's nickel downstreaming policy demonstrates that industrial transformation in resource-rich developing countries is shaped by the interaction between global trade pressure, domestic institutional capacity, and political legitimacy. The findings indicate that Indonesia's export restrictions and downstream industrial strategies were implemented not only to increase domestic value-added production and strengthen industrial competitiveness, but also to reposition the country within the

global electric vehicle supply chain amid intensifying geopolitical competition over critical minerals. This study contributes theoretically by developing an integrative analytical framework that demonstrates how global trade governance, domestic institutional capacity, and political legitimacy interact in shaping industrial policy outcomes. Nevertheless, the findings also reveal several structural challenges accompanying Indonesia's downstream industrial expansion, particularly related to environmental governance, labor conditions, foreign investment dependence, and unequal regional economic benefits.

First, the study recommends that the Indonesian government strengthen environmental governance mechanisms in downstream industrial zones through stricter monitoring of smelter emissions, mining waste management, and energy consumption standards. Most downstream smelter industries continue to rely heavily on coal-fired energy sources, contributing to environmental degradation and increasing carbon emissions in major industrial regions. Therefore, the government needs to implement mandatory environmental compliance evaluations, strengthen supervision by environmental agencies, and gradually encourage the transition toward cleaner industrial energy sources within downstream processing industries.

Second, the government should improve labor protection and workforce development policies in nickel-producing regions. Rapid industrial expansion has generated labor-related tensions associated with workplace safety, wage disparities, and competition between local and foreign workers within industrial zones. To address these issues, vocational and technical training programs should be expanded systematically in areas such as Morowali and Halmahera to strengthen local labor competitiveness in downstream industrial sectors. In addition, stricter labor supervision and occupational safety regulations are

necessary to reduce industrial conflicts and improve working conditions in downstream manufacturing industries.

Third, this study recommends strengthening domestic industrial ownership and technology transfer mechanisms within foreign investment partnerships. Indonesia's downstreaming policy has successfully attracted large-scale foreign investment, particularly from Chinese corporations dominating smelter development and industrial infrastructure projects. However, excessive dependence on foreign capital and technology may weaken long-term industrial sovereignty and domestic industrial capacity. Therefore, the government should require stronger domestic participation through joint industrial partnerships, local content requirements, and mandatory technology transfer programs to ensure that downstream industrial expansion contributes to sustainable domestic industrial capability development.

Fourth, the study emphasizes the importance of improving fiscal redistribution mechanisms and regional economic inclusion in downstream industrial development. The economic benefits generated by nickel downstreaming remain concentrated within specific industrial zones, while surrounding local communities often experience limited welfare improvement and increasing environmental pressure. Consequently, the government should allocate a greater proportion of downstream industrial revenues, royalties, and taxes to local governments in nickel-producing regions to support infrastructure development, environmental recovery programs, public services, and community economic empowerment. In this regard, sustainable downstream industrial transformation requires not only industrial growth and export expansion, but also stronger institutional governance and more equitable distribution of economic benefits at both national and regional levels.

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