

Indonesian Government in the Development of the Global Electric Vehicle Industry through Investment and Nickel Downstream

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Abstract

This study aims to analyze the role of the Indonesian government in developing the global electric vehicle industry through the potential of nickel. This research focuses on investment and downstream case studies in Indonesia. The aim is to evaluate the strategic steps taken by the government in attracting investors and encouraging downstream activities for Indonesia's nickel potential in supporting economic growth. This research was conducted using qualitative research methods by presenting findings through online media, this research data comes from online news media. This data was obtained using the Ncapture feature on Nvivo 12 Plus. The results of the study show that the role and strategic steps taken by the Indonesian government in nickel downstream and investment in Indonesia are largest downstream by 40.74%, secondly in export bans by 24.07%, thirdly in nickel smelter investment by 18.52% and finally, the development of the battery and electric vehicle industry at 16.67 and the results of Wordcloud analysis show that the most popular words on the issue of nickel potential development are downstream export bans, electric smelters, and also electric vehicles

Keywords: *Nickel, Investment, downstream*

JEL Classification: O13, O25, L52

INTRODUCTION

The mineral source of nickel is an important commodity in the development of the electric vehicle industry in the world. Indonesia is the country with the most nickel reserves in the world, along with Australia in first place with reserves of 21,000,000 million metric tons (U.S. Geological Survey (USGS), 2021). The data shows that Indonesia's nickel resources are very supportive of improving the economy through exports, investment, etc. Investing is a way to productively develop your assets. The capital market can be invested in stocks that are important to economic activity. (Agung & Adi, 2022)

The Indonesian Government's efforts to support increased investment and downstream nickel in Indonesia, by increasing the number of nickel smelters. The government is targeting to build 53 smelters by 2024, of which 19 smelters will be built in 2021 and 4 other smelters are expected to be completed by the end of the

year. The four smelters are owned by PT Aneka Tambang Tbk. Construction is 97.7 percent, PT Smelter Nickel Indonesia (100 percent), PT Cahaya Modern Metal Industry (100 percent) and PT Kapuas Prima Citra are developing at 99.87 percent. (Personal, 2023). Therefore, to support this policy, the government is targeting the construction of 53 smelters by 2024, including 30 nickel smelters, 11 bauxite smelters, 4 copper smelters, 4 iron smelters, 2 manganese smelters, 1 lead smelter, and 1 zinc smelter. The total investment is US\$21.59 billion and the electricity requirement is 5.6 GW (Fia, 2022).

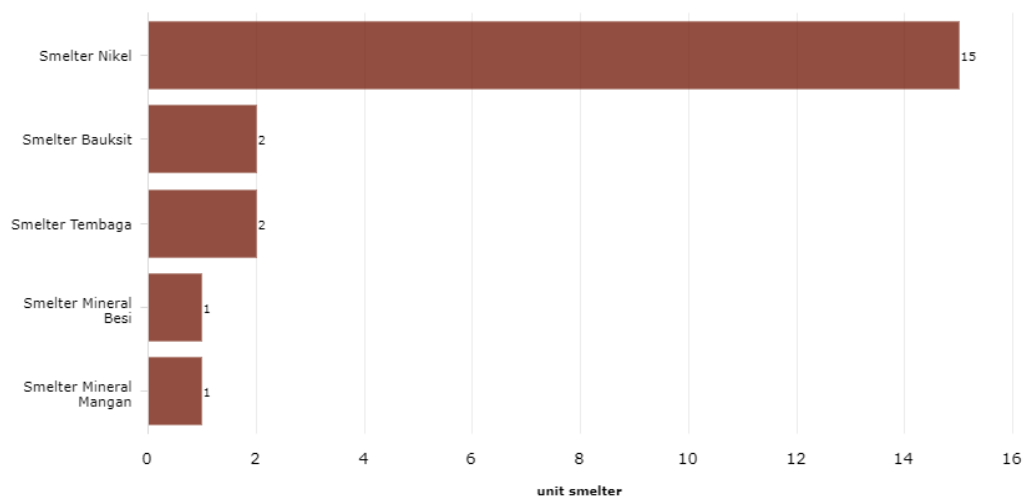


Figure 1. Number of Smelters in Indonesia, November 2022

According to the Ministry of Energy and Mineral Resources, there are currently 15 nickel smelters in Indonesia. There are also two bauxite smelters, two copper smelters, an iron ore smelter, and a manganese ore smelter. Downstreaming has the good objective of adding economic value to natural resources, creating lots of jobs, and increasing government revenue. The economic base, including downstream, must be strengthened so that Indonesia's competitiveness can continue to grow (Adi, 2022).

The Minister of Energy and Natural Resources, in Regulation Number 11 of 2019, made amendments to Regulation Number 25 of 2018 concerning Mineral and Coal Mining Business Permits. Starting from January 2020, there is a prohibition on exporting raw nickel ore with a grade lower than 1.7 percent. This decision was made to safeguard nickel reserves and ensure a consistent supply from existing smelters. (Peraturan Menteri Energi dan Sumber Daya Mineral Republik Indonesia, 2019) One of the key reasons behind this export ban on nickel ore is its importance as a raw material for components used in electric cars. The government has accelerated this ban to support its initiative to fast-track the electric car program. The electric vehicle (EV) industry heavily relies on nickel for the production of EV batteries. This initiative is outlined in Presidential Decree No. 55 of 2019, aimed at expediting the development of battery-based electric vehicles for highways.

Indonesia also possesses the technology to process low-grade nickel, which can be transformed into cobalt and lithium, essential raw materials for electric vehicle battery production. This is an integral part of the broader electric vehicle manufacturing program in the country (Presiden Republik Indonesia, 2019).

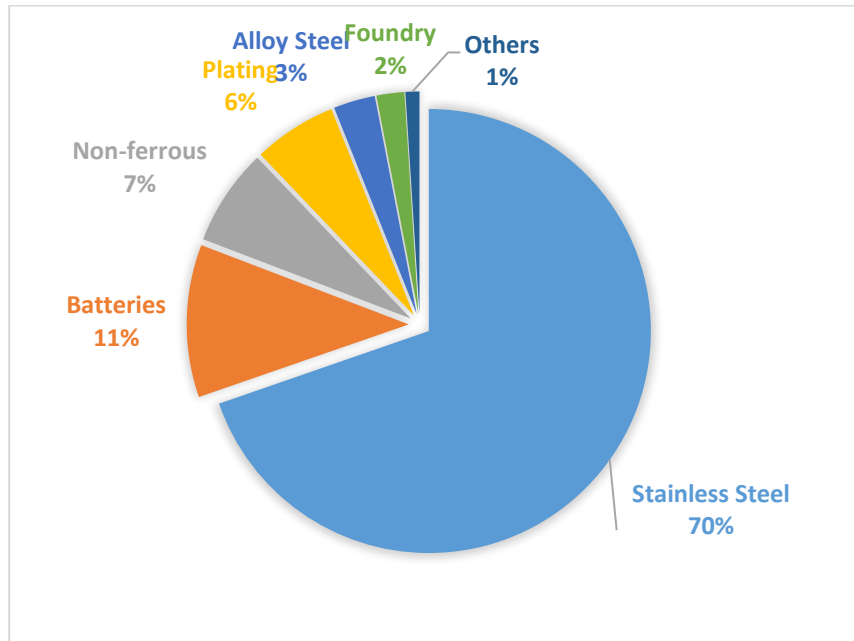


Figure 2. Production of Nickel in Indonesia

The purpose of this research is to see the potential of nickel minerals in Indonesia to increase investment and nickel downstream in Indonesia to keep up with the development of the electric vehicle industry in the world. Ford Motor Co., merged with PT. Vale Indonesia Tbk. And Zhejiang Huayou Cobalt in a nickel smelter project worth US\$ 4.5 billion or around Rp. 67.6 trillion Rupiah in Pomalaa, Kolaka Regency, Southeast Sulawesi. The investment made by Ford as a car manufacturer from the United States aims to catch up with the world's electric car market leader, namely Tesla (Happy, 2023).

According to Mining Industry Indonesia (MIND ID) regarding the supply chain of the electric vehicle industry, nickel minerals can be processed to become raw materials for electric vehicles, and the construction of electric vehicle (EV) charging stations can become state income. Downstreaming is part of the industrialization process. Industrialization has driven a change from a country that is highly dependent on its natural resources to a country that is independent of an economic perspective in terms of human welfare. The achievement of local industrialization relies not solely on the downstream mining sector but also necessitates the growth of supplementary downstream processing or domestic manufacturing industries responsible for creating finished goods for public use.

Based on data from the Central Statistics Agency (BPS) which has been processed by the Investment Coordinating Board (BKPM), the export value of nickel products in 2022 will increase to US\$29 billion from US\$3.3 billion. The downstream policy, which began with a ban on exports of raw nickel in 2020, is the starting point for the Government of Indonesia to be able to manage nickel products domestically so that it can increase the added value of processed nickel products and increase investors in the nickel sector (Yogatama, 2023).

In 2020, the Government of Indonesia decided to enforce a ban on the export of nickel ore commodities to the global market. Indonesia has considered a policy of freezing exports of minerals (including nickel ore) since 2009 which was implemented in 2014. Freezing exports and efforts to downstream minerals in 2014

failed because they were not supported by adequate infrastructure and a lack of mining enthusiasts. Investment is hurting the country and the sharp decline in mineral exports is not matched by an increase in processed products (Östensson, 2019). In response to the program's failure, the Indonesian government issued the Minister of Energy and Mineral Resources Decree No. 5 of 2017, which contains provisions for relaxing mineral export restrictions. In 2018, the export relaxation policy was outlined in PP no. 25, where export relaxation will continue until January 2022 (Pusat Kajian Anggaran RI & Nadya, 2021).

As outlined in its 2016 Nationally Determined Contribution (NDC), Indonesia has pledged to decrease greenhouse gas emissions by 29 percent by 2030 in a trade scenario, and up to 41 percent with international assistance and financial backing. The Indonesian government aims to realize this objective through various strategies, including the adoption of electric vehicles. Despite recent advancements in biofuels, the nation intends to boost the usage of electric vehicles to mitigate harmful emissions. In 2016, Indonesia's transportation sector generated 134.5 million metric tons of greenhouse gas emissions, marking a 318 percent increase compared to 1990 levels. This sector contributed 24.71 percent of the country's greenhouse gas emissions, positioning it as the second-largest contributor, with emissions stemming from the energy sector (Veza et al., 2022).

Boosting electric car production in Indonesia will still contribute to economic growth because it only comes from one sector. Therefore, the Indonesian government's efforts to leverage its large nickel reserves to encourage fast-growing downstream users, such as battery and electric vehicle manufacturers, to be located in Indonesia makes sense. On the downside, however, the study found that the additional production of batteries and electric vehicles, even if small, incurs additional external emission costs (Pirmana et al., 2023).

Furthermore, in March 2021, Indonesia established the Indonesia Battery Corporation (IBC) with equal ownership shared among four state-owned companies involved in aluminum smelting, mining, oil and gas, and electricity (PT Indonesia Asahan Aluminum/Inalum, PT Aneka Tambang Tbk/ANTM, PT Pertamina, and PT PLN). In July 2021, IBC also entered into a memorandum of understanding with Hyundai Motor Group and LG Energy Solution from South Korea to establish a factory for manufacturing electric vehicle battery cells (Hyundai, 2021).

METHOD

The research employs a qualitative methodology with the objective of systematically, objectively, and accurately describing the data acquired from news articles in the media (Soehardi et al., 2021). The research utilizes secondary data sourced from online news media that is pertinent to the subject of the study. Table 1 presents the news sources that researchers have examined concerning the Role of the Indonesian Government in the Development of the Global Electric Vehicle Industry Through Nickel Potential: Case Studies of Investment and Downstreaming in Indonesia. Based on the table, it is evident that the researchers examined six different online media outlets. This study selected six online news media platforms, taking into account their brand trust (Dumouchel, 2022) and high credibility based on Semrush, which is online-based software used for planning and executing SEO

(search engine optimization), SEM (search engine marketing), social media research, and video advertising efforts.

Table 1. News Sources Concerning the Role of the Indonesian Government in the Development of the Global Electric Vehicle Industry through Nickel Potential

Online Media	Website	Media Consumption	Brand Trust Online Media	Related News
Detikcom	https://www.detik.com/	65%	61%	50
Kompas	https://www.kompas.com/	50%	65%	50
CNN Indonesia	https://www.cnnindonesia.com/	40%	66%	45
tribunnews	https://www.tribunnews.com/	40%	52%	43
Liputan6	https://www.liputan6.com/	50%	55%	50

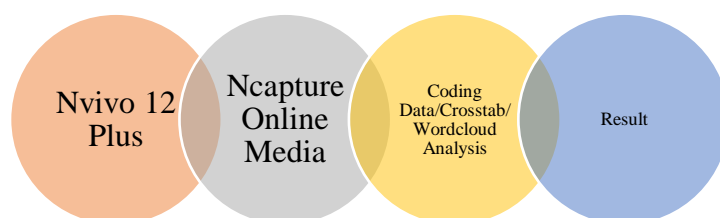


Figure 3. Data Analysis Process

Semrush regularly updates the rankings of news websites and online media globally, including those in Indonesia. Additionally, the data analysis process is illustrated in Figure 3. The data was collected using the Nvivo 12 Plus feature, specifically the Ncapture extension, which is a web browser tool developed to capture web content, including website content, social media content, and other document types such as scientific articles. The analysis in NVivo 12 Plus employs the crosstab query analysis feature, which presents the percentage of manually encoded news data using the NVivo 12 Plus tool. Subsequently, the author utilizes the word cloud analysis, one of the featured tools in Nvivo 12 Plus, to identify frequently occurring words or concepts within the research documents, visualizing and gathering data/words that exhibit similarities and differences.

RESULTS AND DISCUSSION

The potential of Nickel as Raw Material for Electric Vehicle Batteries

European Union countries consider Indonesia to have secured the position of being the second-largest nickel exporter globally, with a particular emphasis on serving the steel industry in various countries that rely on Indonesia for their raw material needs. Nickel plays a crucial role in the electric car industry's production, particularly in the manufacturing of batteries used in electric vehicles. These electric cars utilize lithium-ion batteries, comprising an anode, cathode, and electrolyte. Nickel stands out as the primary metal component in these batteries, notably in the cathode of lithium-ion batteries. Moreover, Enrico contends that the lower nickel prices will naturally incentivize entrepreneurs to increase the nickel content as the primary component for electric vehicles. (Sabowo & Siswanto, 2023) As the largest nickel exporter in the world, Indonesian nickel minerals can be developed by the government to bring in investment potential and become one of the electric vehicle (EV) battery manufacturers with the development of the fast-growing electric vehicle industry.

Global demand for refined nickel ore is expected with the construction of an electric vehicle battery factory in the future, opening opportunities for the downstream nickel industry in Indonesia and encouraging the government to identify nickel as a priority to accelerate the National Strategic Project (PSN) which focuses on upstream nickel to achieve national energy independence. (Gao et al., 2019)

Halmahera Persada Legend (HPAL) is a pioneering company in Indonesia for electric car battery raw materials. PT Halmahera Persada Legend focuses on processing nickel ore to produce the final products, namely nickel sulfate and cobalt sulfate. Nickel ore with a low nickel content of around 1.6%, often referred to as nickel limonite, is required for battery manufacture. In addition, nickel ore goes through an HPAL (High-Pressure Acid Leaching) process which refines nickel ore in the form of mixed sulfide precipitate (MSP) or mixed hydroxide precipitate (MHP) to become raw material for battery components which are original products. This product itself has a market with a production capacity of 96,000 tons per year. MHP's subsequent processing and refining process produces purer products, namely nickel sulfate and cobalt sulfate, up to 180,000 tons per year as end products (Qothrunnada et al., 2022).

The Government's Role in Electric Vehicle Investment

In numerous sectors, the predominant energy sources, including transportation, households, industrial operations, businesses, power generation, and others like construction, agriculture, and mining, primarily rely on fossil fuels. Electric vehicles (EVs) are regarded as a promising solution to mitigate environmental consequences by decreasing reliance on fossil fuel usage. Presently, the adoption and integration of electric cars in Indonesia, as a developing nation, are in their initial stages. However, it's worth noting that electric vehicles in Indonesia hold significant potential to lower greenhouse gas emissions and enhance energy efficiency (Tambunan et al., 2023).

The government through Presidential Regulation Number 55 of 2019 concerning the Acceleration of the Battery Electric Vehicle Program for Road Transportation, through this regulation the Government of Indonesia wants to develop the Electric Motor Vehicle Industry and exercise control over the use of fossil fuel-based motorized vehicles to reduce the effects negative the environment.

Effective January 1, 2020, the Indonesian government, acting through the Ministry of Energy and Natural Resources (ESDM), enforced a prohibition on the export of nickel ore. Indonesia made this decision to preserve its nickel reserves due to the consistent supply of raw materials from smelters. Despite the political challenges that Indonesia is grappling with, which have implications for its economy, including endeavors to boost government expenditures, enhance the quality of the country's infrastructure, and strengthen trade ties with the European Union, it's essential to take into account tax administration as well. Rest for investors investing in mining, agriculture, electronic products, furniture, etc. Training or training for exporters/SMEs who export their products to European countries on an ongoing basis can be carried out through ongoing training (Ilmi et al., 2022),

As Indonesia moves from conventional fossil fuel cars to electric vehicles, the government offers subsidies and incentives for electric vehicle purchases as

outlined in Presidential Regulation (Perpres) No. 55 of 2019, which pertains to the acceleration of the Battery-Based Electric Vehicle Program (KBLBB). It's crucial to consistently emphasize to the government that this shift from fuel to electricity will lead to a substantial surge in electricity demand (Aziz et al., 2020). Solving this problem requires strong cooperation between the electric car industry, power companies, and the Indonesian government.

The Indonesian government through the State Electricity Company (PLN) is providing attractive offers to consumers who wish to supply electricity to their homes. In this program, the government provides discounts to customers who provide additional electrical power from 220 VA to 197 kVA. Discount categories range from 50% to 100%; This is a non-public infrastructure to develop the future of electric cars in Indonesia (Yuniza et al., 2021). The government can cooperate with various agencies and the private sector in the development of nickel smelters, electric vehicle battery factories, Public Electric Vehicle Charging Stations (SPKLU), and electric vehicle factories to increase Indonesia's investment and economic potential.

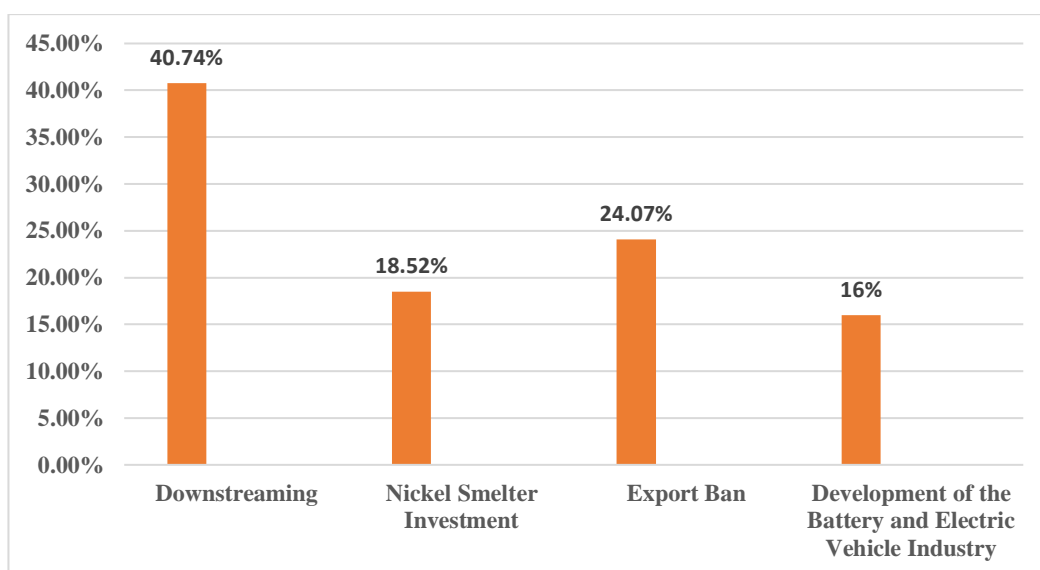


Figure 4. The Role of Government in Electric Vehicle Investment
Source: processed data used by The NVivo Application)

The diagram above shows that the role of the government in electric vehicle investment downstream is the highest at 40.74% and the second is the export ban of 24.07%, then investment in nickel smelters at 18.52% and development of the electric vehicle industry at 16.67% . From the analysis of the data above, it can be concluded that the Indonesian government is focused on downstream and banning exports.

According to the 2013 DJMB Geological Agency (Directorate General of Coal Minerals), laterite resources in Indonesia reach 3,565 million tons of ore (more than 3.5 billion tons) or the equivalent of 52.2 million tons of Ni metal. While the amount of laterite reserves reached 1,168 million tons of ore (more than 1.1 billion tons) or equivalent to 22 million tons of Ni metal. Based on exploration results by BUMN PT Aneka Tambang in PT Aneka Tambang's working area until 2012, Based on data published in January 2015 by the US Geological Survey, globally

around 60% of nickel natural resources are in the form of laterite. Until 2013/2014 Indonesia was one of the countries with the world's largest mining production (Prasetyo, 2016).

This export ban does not aim to meet the raw material needs of existing smelters in Indonesia and does not aim to utilize nickel resources for the nation's prosperity through the domestic processing chain. Considering that mineral wealth, including nickel, is a non-renewable non-renewable resource, it is time for Indonesia to make use of its natural wealth independently for the welfare of society by downstream mining minerals. Based on the provisions above, the government has again regulated the downstream mineral plan into Law Number 4 of 2009 concerning Minerals and Coal, in which Articles 103 and 170 state that mineral downstream or refining must be carried out no later than five years after the regulation was issued. That is, in 2014 mineral downstream should have been carried out, but the government made concessions because the smelter industry in Indonesia was not ready, so the discourse was postponed to 2022 and then accelerated to early 2020, because the government considered that Indonesia's smelter industry was sufficient and growing, too are ready to produce their mines (Eni, 1967).

However, it should be noted that the success of downstream mining cannot be separated from policies and technical regulations in its implementation, namely taking into account that the mineral downstream policy is a fiscal instrument aimed at enhancing the added value of minerals, boosting domestic industrial performance, raising government revenues, stimulating economic growth, and generating employment opportunities through the provision of resources such as raw materials, land, labor, energy, infrastructure, technology, operational and maintenance activities, licensing systems, and investment financing activities (Suriani et al., 2021). Indonesia cannot continue to rely on taxes as state income. Indonesia must be able to stand alone and be able to rely on the natural wealth owned by the state independently without the help of foreign parties.

Currently, Indonesia is considered capable of producing its raw mineral materials into finished materials, judging from the number of smelters that have been established and are capable of operating in 2020. If processing can be optimized, downstream nickel will be formed and provide added value to the Indonesian economy due to the value of various mining products. So what has been processed has a much greater value than the value of the exported raw materials. So that from an economic standpoint, Indonesia will gain big profits and gradually be able to compete in the global market in terms of mining

Downstream Nickel To Drive Investment

Overall the agenda to be carried out downstream of the nickel ore sector is to increase smelter construction projects, build a stainless steel industry, build a battery and electric vehicle industry, and build an industry to utilize ferronickel slag for the manufacture of magnesium and ferroalloys (Cahyani, 2023). Using Regulation of the Minister of Energy and Mineral Resources (ESDM) of the Republic of Indonesia Number 11 of 2019, the Indonesian government enforced a prohibition on the export of nickel ore starting from January 1, 2020, as specified in Regulation of the Minister of Energy and Mineral Resources Number 11 of 2019. The regulations prohibiting the export of nickel ore are held to be able to

downstream nickel so that it can add value to the nickel mineral itself and can encourage economic growth. (Djalante et al., 2020) The capital market can be invested in stocks that hold a significant position in economic activities. Investors take into account various factors when deciding where to invest their capital, including natural resources, human resources, political and economic stability, government policies, and the simplicity of obtaining licenses. As of October 12, 2021, investment actualization in the mineral and coal sub-sector amounted to only \$3.5 billion, equivalent to 81.3 percent of the \$4.3 billion target (Gunawan et al., 2022). The development factor of the electric vehicle (EV) industry and the abundant potential for nickel minerals in Indonesia along with the downstream process carried out by the government to add value to nickel can encourage investors to invest in Indonesia to build nickel smelters and electric vehicle battery manufacturing factories or electric vehicle factories.

Various calculations have been carried out for this downstream business, including the state-owned mining company PT Indonesia Asahan Aluminum (Inalum), which indicates that downstream mining can contribute up to seven times the added value. This calculation is based on a comparison of the value of US mineral exports between raw and processed products. After the refining process, the share of mineral mining products in the US GDP increased from 0.62% to 4.63% (Reveilhac, 2022).

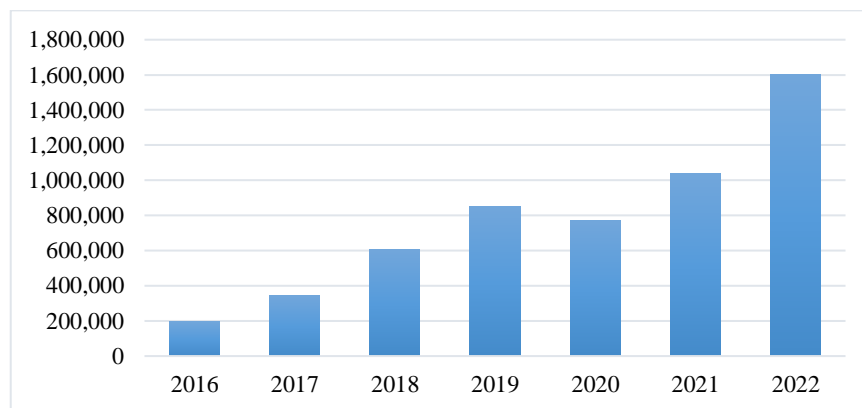


Figure 5. Nickel Production in Indonesia, 2016-2022 (in Metric Tons).
Source: Melissa Garside (statista), 2023.

The development of nickel production in Indonesia which continues to increase can encourage investors to invest in the construction of nickel smelters, construction of electric vehicle battery factories, electric vehicle factories, construction of electric vehicle battery charging stations, and others. Investor involvement can begin by advancing the hydrometallurgical sector, it becomes possible to process limonite nickel ore into a blend of nickel and cobalt compounds. Subsequently, these compounds can be refined further to create pure nickel and cobalt compounds, typically in the form of sulfate and hydroxide compounds (Mahalana et al., 2021).

The establishment of an electric vehicle battery industry ecosystem in Indonesia will have significant economic implications. These consequences encompass the attraction of investments, job creation, potential government revenue, and the impact on the growth of the gross domestic product (GDP). The

transformation of this industry domestically. (2) Export Ban: The ban on nickel exports is one of the government's strategic steps to encourage downstream. By banning the export of raw nickel, the government is encouraging industry players to process nickel into finished products domestically. This aims to reduce dependence on exports of raw materials and increase the added value of the country's economy.

(3) Nickel Smelter Development: The government plays an active role in encouraging the construction of nickel smelters in the country. Smelters are important facilities for processing nickel ore into ferronickel or other nickel products. With a smelter, nickel's added value potential can be maximized, creating a strong downstream industry, and increasing the independence of the domestic nickel industry. (4) Development of Electric Vehicles: The government has a role as a policy maker in encouraging the use of electric vehicles that require nickel batteries. By encouraging the development of electric vehicles, the demand for nickel as a raw material for batteries will increase, providing opportunities for expansion of the domestic nickel industry and increasing the economic value of these commodities.

Overall, the government's role is very important in encouraging downstream investment in the nickel industry. By implementing the right policies and support, the government can create a conducive environment for the development of the nickel industry, increase economic added value, and achieve sustainable development goals for the country.

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