

Legal Framework of Indonesia's Energy Transition: Regional Autonomy and Chinese Investment in Green Development

William Ong^a, Marhaeni Ria Siombo^b, Emmanuel Ariananto Waluyo
Adi^c✉

^a World Capital Tower, 50th Floor, Mega Kuningan, Setiabudi, Jakarta
Selatan 12950

^b Faculty of Law, Borobudur University

^c Kementerian Sekretariat Negara RI, Jl. Veteran No.18 2, RT.2/RW.3
Jakarta Pusat

✉Corresponding email: eadiiwwaluyo@gmail.com

Abstract

In response to global efforts to reduce greenhouse gas emissions, Indonesia is promoting the adoption of electric vehicles (EVs), particularly battery-based electric motor vehicles (KBLBB), most of which are imported from China. This initiative aligns with the national commitment to achieve Net Zero Emissions by 2060 and transition from fossil fuels to renewable energy. The government has issued several legal instruments, including



Copyrights © Author(s). This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. (CC BY-SA 4.0). All writings published in this journal are personal views of the author and do not represent the views of this journal and the author's affiliated institutions.

Presidential Decree No. 79 of 2023 and Presidential Instruction No. 7 of 2022, the latter mandating the use of KBLBB for official vehicles by regional governments. However, implementation at the regional level remains limited. Despite their potential as role models, local governments have not widely adopted KBLBB, in contrast to the central government. This discrepancy is attributed to the non-binding nature of presidential instructions and the autonomy granted to regional governments under Indonesia's decentralization framework. Using a normative juridical method with statutory and conceptual approaches, this study analyzes the effectiveness and legal enforceability of these policies. The key issue lies in the normative authority of presidential regulations versus local autonomy. The study argues that achieving a just and inclusive energy transition requires equitable adoption of KBLBB across all regions. Where regional governments face financial or infrastructural constraints, central government support is essential. Encouraging foreign particularly Chinese investment could accelerate infrastructure development and expand access to EV technology nationwide. Strengthening legal mandates and enhancing intergovernmental coordination are critical to advancing Indonesia's sustainable transportation agenda.

KEYWORDS *Energy, Environment, China*

I. Introduction

The Indonesian government has committed to contributing to reducing Green House Gas (GHG) emissions as agreed by World Leaders at the 26th Climate Change Conference of Parties (COP) meeting in Glasgow. This commitment has been outlined in the Enhanced Nationally Determined Contribution (ENDC) document with a target of 31.89% with its own capabilities, and 43.20% with international assistance. Based

on the 2021 GHG Inventory and Monitoring, Reporting, Verification (MPV) Report of the Ministry of Environment and Forestry, the national GHG emission level in 2020 was 1,050,413 Gg CO₂e, with the energy sector as the largest contributor, namely 584,284 Gg CO₂e (56 %). From the energy sector, GHG emissions in Indonesia are expected to continue to increase in 2021-2030 in line with the increasing use of fossil fuels . 1

The energy transition is a long process that countries must carry out to reduce carbon emissions, which can cause climate change. The agreement on the energy transition aims to reach the same point, namely the increasing use of clean energy. The President's direction in the S20 High-Level Policy Webinar on Just Energy Transition on March 17, 2022, stated that an energy transition is needed to change the utilization and use of fossil fuels to renewable energy. The energy transition will also change many things, including job changes, development scenarios, business orientation, etc. Therefore, appropriate strategies and mechanisms are needed to identify current and future challenges, so that a just and equitable low-carbon energy transition can be implemented well. 2.

The energy transition program designed by President Joko Widodo targets Indonesia to achieve zero or net zero emissions (NZE) by 2060 or sooner. One of the programs implemented by the government to realize this target is through the Battery-Based Electric Motor Vehicle Program (KBLBB) for road transportation. During a working visit to the Batang Integrated Industrial Zone (KITB), the President said that the Government would build a large ecosystem from upstream to downstream for the electric car industry, starting from nickel mining, smelters,

¹ Information and documentation Management Officer, "Enhanced NDC: Indonesia's Commitment to Contribute More to Maintaining Global Temperatures", in <https://ppid.menlhk.go.id/berita/siaran-pers/6836/enhanced-ndc-komitmen-indonesia-to-contribute-more-in-maintaining-global-temperature> accessed on 13 February 2024

² Chandra Gian Asmara, "Jokowi Reveals 3 Big Challenges of Energy Transition, What Are They?", in <https://www.cnbcindonesia.com/news/20220317165533-4-323703/jokowi-Reveal-3-tantangan-besar-transisi-energi-anything> accessed December 23, 2023

refineries, cathode and precursor industries, lithium batteries, KBLBB batteries, cars electricity, to the electric battery recycling industry.³ The government keeps pushing to increase efficiency and energy conservation to support transitioning energy to clean and sustainable energy. One of the efforts that can also be made to transition energy clean is the push formation of the KBLBB ecosystem . With condition provision infrastructure electricity moment this, capacity and distribution supply electricity national has stated Ready For support use car electricity, even in some area reserve power electricity Ready accommodate surge Power addition.

KLHK 2023, the dominant cause of pollution is 44% of the transportation sector, such as motorbikes and cars, which use fossil fuel energy—followed by the industrial sector 31%, manufacturing 10%, housing 14%, and commercial 1%. Based on data from Kakorlantas National Police, the number of motorbike vehicles that use fuel rose 1.09 percent compared to data for January 2023, which was 152,565,905 units. The number of cars registered by motorbikes also exceeds half of Indonesia's population, reaching 276 million souls. From the amount, motorbikes rank first with a total of 128,678,586 units. Meanwhile, car passengers had 19,233,314 units. Sumatra Island occupies position second with figure 31,782,883 units. Next is the island of Kalimantan, which recorded its number of vehicles that motorized as many as 11,133,725 units. The island of Java contributed to the number of cars, with the number of owned vehicles motorized being 92,036,868 units, or 59.67 percent of the total of cars motorized⁴. So, it is deemed necessary to decentralize the potential of EBT for conversion to KBLBB in each deep area . This President has Instructions President (Inpres) Number 7 of 2022 concerning Use Vehicle Electric Motor Based Battery (Battery

³ Mambak & Bambang, " *Forecasting Lead Acid Battery Capacity in Electric Cars Based on Levenberg Marquardt Neural Network*." *Scientific Technology* 2017 vol 2, pp 112-117.

⁴ <https://ombudsman.go.id/article/t/ombudsman-ri--govt-central-region-besar-sync-politik-pengembangan-kendaraan-listrik>

Electric Vehicle) As Operational Service Vehicles and Vehicle Individual Service Agency Central Government and Regional Government. Government area in matter This can role as a role model for using KBLBB to people in their area so that the community is more Certain For using KBLBB and the government area Of course, need to prepare a scheme For support The KBLBB ecosystem is one of them Work The same investment.

Implementation of Presidential Instruction 7 of 2022 has not yet been fully realized in each area. According to Directorate data from the General Ministry of Finance (Kemenkeu) State Assets, the total number of vehicles serviced to the government in 2022 will reach 189,803 units. 5. However, to Presidential Instruction, several voices from the head acting agency are against it. The mayor of Surakarta, Gibran Rakabuming, went viral and deleted the budget car electricity For the Mayor and Deputy Mayor of Surakarta in 2022 because the required budget For buying One car of electricity reached IDR 800 million and considered those funds to be used For building markets and parks intelligent, compared buy car electricity. New There are three government provinces of the 38 provinces with base law as a derivative of Presidential Instruction 7 of 2022, namely Jakarta, South Sumatra, West Java, East Java, and Bali. This matter felt. Of course, if every area evenly uses KBLBB, transition energy will be sped up.

This article adopts a **qualitative-normative juridical approach** that views law simultaneously as a body of written norms and as an instrument that interacts with economic-political realities. The research relies on two complementary legal approaches: **(i) the statutory approach**, which maps the hierarchy, substance and force of regulations governing Indonesia's energy transition—most notably *Presidential Instruction No. 7 of 2022* on battery-electric vehicles, *Presidential Regulation No. 112 of 2022* on

⁵ <https://video.kompas.com/watch/184025/189803-unit-kendaraan-dinas-government-akan-diganti-mobil-listrik-beranggaran>

renewable-energy acceleration and *Presidential Decree No. 79 of 2023* on the Grand National Energy Strategy; and (ii) **the conceptual approach**, which explores doctrinal principles of regional autonomy and sustainable development to explain why non-binding presidential instructions may (or may not) influence sub-national behaviour.

Primary legal materials comprise laws, presidential regulations, ministerial regulations and regional bylaws that structure the electric-vehicle (EV) ecosystem. **Secondary** materials include academic monographs (e.g. Soekanto 2006; Marzuki 2010) and peer-reviewed articles on climate and investment law, while **tertiary** materials encompass policy briefs, official statistics (KLHK emission inventory; Ministry of Finance asset data) and reputable news reports that document implementation gaps and stakeholder reactions. By combining these sources, the study evaluates the juridical coherence, practical enforceability and distributive impact of Indonesia's EV policy, particularly the potential of Chinese investment to close infrastructure and financing gaps in the regions.

Data Collection and Analysis Techniques

Data were gathered through a **doctrinal document study**. The process began with systematic retrieval and coding of all primary regulations relevant to EV deployment and energy transition. Complementary policy documents—such as the *Roadmap toward Net-Zero Emissions 2021-2060* issued by the Ministry of Energy and Mineral Resources—were then cross-checked against emission statistics and investment data to contextualise the legal texts. Scholarly commentary and case notes were downloaded via HeinOnline and Google Scholar to capture recent academic debates on normative strength and comparative practice.⁶

Analysis followed a **qualitative descriptive-analytical sequence**:

⁶ Soerjono Soekanto, *Pengantar Penelitian Hukum* (Jakarta: UI Press, 2006), hlm. 52.

1. **Data reduction**, key provisions, implementation dates, sanctions and incentive clauses were extracted from each regulation.
2. **Data display**, the reduced information was organised in thematic matrices (e.g. “fiscal incentives”, “regional obligations”, “foreign-investment safeguards”) to reveal convergences and gaps.
3. **Conclusion drawing/verification**, interpretive techniques (grammatical, systematic and teleological) were applied to test the coherence of the regulatory framework; findings were continuously compared with empirical policy outcomes (vehicle-conversion statistics, provincial adoption rates) to verify consistency.

To enhance **validity**, the study employed **triangulation** on three levels:

- **Source triangulation** comparing statutory texts with official datasets and independent academic analyses;
- **Method triangulation** cross-checking doctrinal interpretation with descriptive statistics and content analysis of media reports;
- **Theory triangulation** testing observations against theories of good governance, regulatory compliance and investment law.⁷

This multi-layered strategy ensures that conclusions about the effectiveness of Indonesia’s EV regulations including the role of Chinese capital in accelerating nationwide deployment rest on a rigorous, well-substantiated legal analysis.

II. Opportunities for the Energy Transition in Indonesia Through Battery - Based Electric Motorized Vehicles

Climate change become a problem for the global community, including Indonesia, because the increase in global temperature has caused changes in climates in various parts of the world. One of the leading causes

⁷ Peter Mahmud Marzuki, *Penelitian Hukum* (Jakarta: Kencana, 2010), hlm. 133.

of climate change is the emission of carbon. Emission is the amount of gas, heat, and light emitted. Simple emissions of carbon are released into the atmosphere. Emission of carbon is one reason for climate change around the world. Change process This will, in a way, have no direct impact on the environment and health of humans, creating an unstable economy. An energy transition is needed to change the utilization and use of fossil fuels to renewable energy (EBT). To achieve the NZE target, the government is implementing five main principles, namely increasing the use of New Renewable Energy (EBT), reducing fossil energy, electric vehicles in the transportation sector, increasing electricity use in households and industry, and using Carbon Capture and Storage (CCS).⁸In line with this, a Roadmap towards Net Zero Emissions in the Energy Sector from 2021 to 2060 has also been prepared. In 2021, the government will issue regulations in the form of a Presidential Regulation regarding EBT and retirement coal so that there will be no additional new PLTUs except those already under contract or already under construction, as has been issued by Presidential Regulation Number 112 of 2022 concerning the Acceleration of Renewable Energy Development for Power Supply. Electricity. Indonesia has no EBT-priority primary energy source, but it still uses coal as energy. Banzragch's review of Mongolia demonstrates how "legal fragmentation hampers coherent emission-reduction planning in coal-dependent economies."⁹

Presidential Decree Number 112 of 2022 on the Acceleration of Renewable Energy Development for Electricity Supply is a legal instrument that is philosophically grounded in the values of environmental justice, sustainability, and clean energy transition. Its ideal aim is to reduce dependence on fossil fuels and accelerate the achievement of a renewable

⁸ EBTKE KESDM Public Relations, "These are the Government's Principles and Roadmap to Achieve Net Zero Emission" in <https://ebtke.esdm.go.id/post/2021/10/11/2986/ini.princi.dan.peta.jalan.anggaran.capai.net.zero.emission> accessed on December 23, 2023

⁹ Banzragch, Tsolmon. "An Analysis of the Climate Change Legal Regime in Mongolia." *Chinese Journal of Environmental Law* 9, no. 1 (2025): 48-87.

energy mix to support the national Net Zero Emissions (NZE) target by 2060. However, in practice, the regulation reveals structural weaknesses, especially in its relationship with the principle of regional autonomy. According to Maria Farida Indrati, a presidential decree must not contradict or reduce the authority granted by laws, particularly regarding the constitutional rights of regional governments¹⁰. Cocciolo and Reins conclude that the ECT “functions as an obstacle—rather than a conduit to a just energy transition.”¹¹

Meanwhile, Jimly Asshiddiqie emphasizes that in a decentralized government system, national policies should be formulated with meaningful involvement of regional actors to avoid institutional resistance and ensure effective implementation.¹² The primary weakness of Presidential Decree No. 112/2022 lies in the lack of concrete mechanisms for engaging regional governments in the planning and implementation of renewable energy projects. This top-down approach may conflict with the spirit of autonomy guaranteed by Article 18 of the 1945 Constitution and Law Number 23 of 2014 on Regional Government, potentially leading to implementation gaps and local non-compliance. Law, (Jakarta: Rajawali Pers, 2019), p. 203.

Table 1

Primary Energy		MBOE	%
1	Crude oil	548.99	30.18
2	Coal	736.00	40.46
3	Natural gas	296.11	16.28
4	EBT	238.12	13.09

¹⁰ Maria Farida Indrati, *The Science of Legislation: Types, Functions, and Material Content*, (Yogyakarta: Kanisius, 2007), p. 159.

¹¹ Cocciolo, Endrius, and Leonie Reins. “A Critical Review of the Energy Charter Treaty from an Earth System Law Perspective.” *Transnational Environmental Law* 14, no. 1 (2025): 94-120.

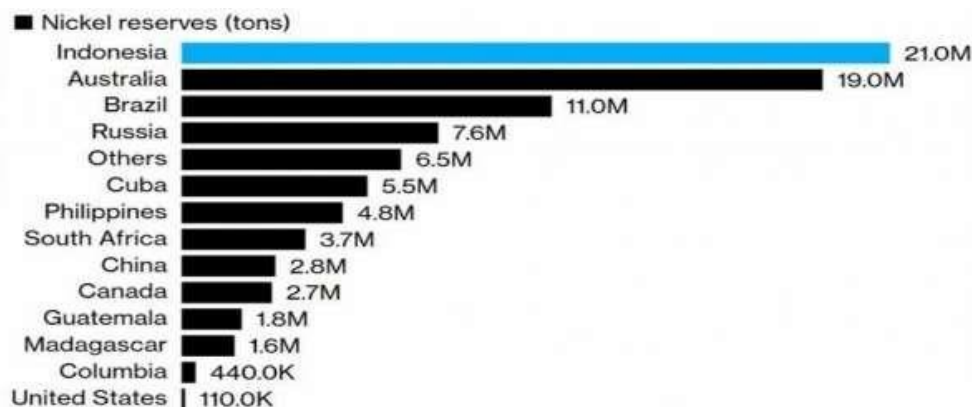
¹² Jimly Asshiddiqie, *Introduction to Constitutional Law*, (Jakarta: Rajawali Pers, 2019), p. 203.

Total	1,819.23	100.00
-------	----------	--------

Source: Ministry of Energy and Mineral Resources June 2024

Indonesia has 21 million tons of nickel reserves, equivalent to 30 percent of the world's nickel production; Indonesia has the potential to be one manufacturer of battery car electricity in the world. Besides nickel, Indonesia has the necessary battery materials, such as aluminum, copper, manganese, and cobalt. With the production of battery car electricity, Indonesia can produce Battery Electric Vehicles (BEV) and Electric Vehicles (EVs) at a more competitive price, especially for the car market's electricity-based battery. This also supports Indonesia's destination for transitioning from a mode of transportation made from burned fossils to a more friendly environment. 13.

Figure 1



Potential Indonesian nickel for support production of battery electricity.

Source: The world Nickel reserves (US Geological Survey, 2019)

¹³ Tauhid Ahmad, Andry Satrio Nugroho, dan Dinda Maharani, Development of Battery-Based Electric Cars in Indonesia, INDEF Policy Brief No. 5/2022, Mei 2022.

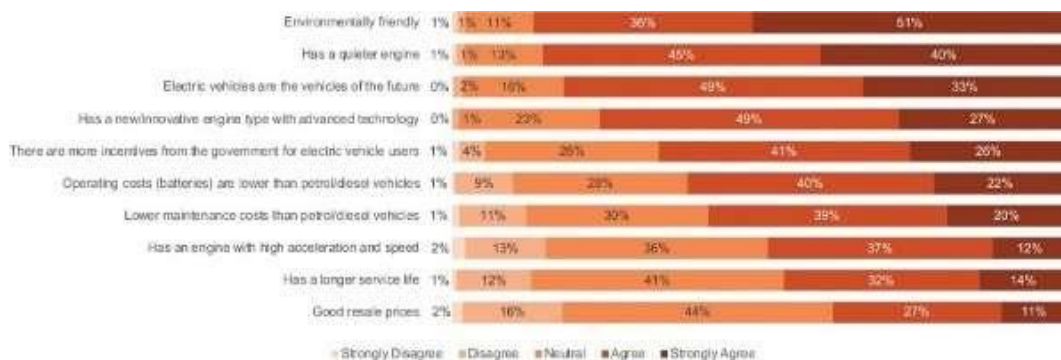
Growth Vehicle Electricity in Indonesia and the region continues to increase with various factors such as support regulations and usage trends globally

Table 2

Type of EV	2016-2021	2022	2023	Total*	Target in 2035**
Two wheeled	13,903	17,198	62,409	93,510	12,000,000
Three wheeled	223	66	31	320	
Four wheeled	1,708	8,562	12,248	22,518	1,000,000
E-Bus	43	34	3	80	
EV Commercial	6	0	4	10	

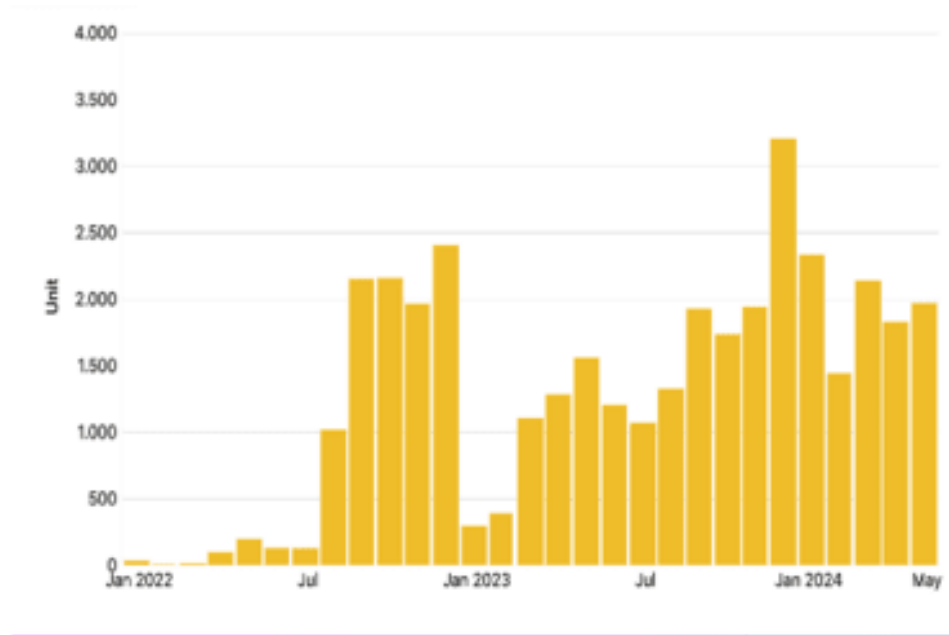
*Ministry of Transportation (SRUT KBLBB), **Ministry of Industry (PermenIndustri 28/2023)

Figure 2



Source: Indonesia EV Consumer Survey, PWC 2023

Figure 3



Source: katadata.id

The Indonesian government is in a serious fight to develop domestic electricity for vehicles. Based on Regulation President Number 22 of 2017, the General National Energy Plan (RUEN) sets usage targets for car electricity as many as 2.2 thousand units in 2025 and 4.2 million units in 2050. In addition, the target use of electric motorbikes is as many as 2.1 million units. Using car electricity will save on material burns and care costs, amounting to IDR 17.62 million annually. Benefits for the Government for 1 million car electricity, pressing imported 1.5 million kilo liters of fuel, saved foreign exchange amounting to IDR 13.02 trillion, a decrease in CO₂ emissions 3.21 million tons/ year, and increasing consumption electricity 2.2 TWh / year Whereas For electric motorbike users (conversion and new) will obtained savings fuel costs amounting to

IDR 2.68 million / year . Benefits for the Government for 900 thousand motorbike units in 2025 is pressing fuel 0.32 million KL/ year, pressing compensation Peralite IDR 0.48 trillion / year, decrease CO2 emissions IDR 0.61 million tons/ year, and increasing consumption electricity 0.38 TWh / year ¹⁴.

Indonesia has extraordinary potential in the world's electric vehicle supply chain ecosystem. For the raw materials for making batteries, Indonesia has nickel reserves reaching 21 million metric tons (MT) in 2020, or the equivalent of 22.34% of the total nickel reserves in the world. Apart from that, the total world nickel production in 2020 was 2, 5 million MT, and Indonesia had a portion of 760 thousand MT, 30.40%. ¹⁵This shows that Indonesia has enormous potential to become the king of electric batteries in the world. To protect this wealth, the government has issued a policy of restricting nickel ore exports through Minister of Energy and Mineral Resources Regulation Number 11 of 2019 concerning the Implementation of Nickel Export Limits, with a certain level (<1.7%) which was accelerated from 1 January 2020 (previously set to take effect from 11 January 2022). This is the right step because there is a significant opportunity to process this nickel ore into cells and battery packs which is very open and will provide far more important benefits than just exporting the raw material, even though we know that this is the impact of the export restriction policy. For this nickel ore, various European countries submitted demands to Indonesia through the WTO forum.

Furthermore, in terms of making cathodes, batteries, and battery cells, Indonesia, through a BUMN consortium in collaboration with LG Energy Solution, has agreed to build an integrated battery factory worth IDR 142 trillion in Maluku and Central Java. Apart from that, there is

¹⁴ <https://ebtke.esdm.go.id/post/2022/11/20/3347/kendaraan.listrik.aksi.nyata.wujudkan.energi.cepat.Bersih.dan.ramah.lingkungan>

¹⁵ Revo M, CNBC Indonesia, This is Anies-Prabowo-Ganjar's Dream About the Indonesian Electric Vehicle Industry, accessed at <https://www.cnbcindonesia.com/research/20240124081907-128-508489/begini-bisnis-anies-prabowo-ganjar-soal-electric-vehicle-industry-ri> on January 25, 2024

also an investment MoU between BUMN and PT CATL from China to build a factory worth IDR 85 trillion, and a memorandum of understanding between the Minister of Investment/Head of BKPM and Foxconn for investment cooperation in the electric vehicle ecosystem with an investment value of IDR 114 trillion. For SPKLU stations, PT PLN (Persero) 16 supports the acceleration of KBLBB infrastructure for public transportation through electricity supply support, cost and tariff incentives, as well as cooperation in providing SPKLU and SPBKLU, such as:

- Home Charging gets a 30% discount from 22.00 to 05.00.
- PLN SPKLU Partnership : Sharing Revenue Model & Franchising Model .
- Providing docking facilities, electric vehicle batteries, and SPBKLU facilities using a franchising business model/scheme.

The huge potential for developing the KBLBB ecosystem in Indonesia, there are also significant challenges that can hinder the pace of development of the KBLBB ecosystem, starting from challenges from the financing side, where huge investments are needed to build and develop the electric vehicle ecosystem in Indonesia from the upstream side to the downstream, the case of the nickel ore export restriction policy at the WTO currently being faced, the fulfillment of TKDN and the absorption of quality labor to support and maintain the development of the domestic electric vehicle ecosystem, to the processing of KBLBB waste which has the potential to pollute and damage the environment in the future. Optimizing the development of the electric vehicle ecosystem in the energy transition effort requires increasing economic benefits through the

¹⁶ Antara, "Ministry of Investment oversees integrated electric battery project", accessed at <https://www.antaranews.com/berita/2931649/kementerian-investasi-kawal-project-battery-listrik-terintegra> on 13 February 2024

industrial value chain formed through the transition process from fuel oil vehicles to electric vehicles.

The issuance of this regulation is in line with the policy contained in the 2021-2030 Electricity Supply Business Plan (RUPTL) which prioritizes the use of New, Renewable Energy. In 2022, the New Energy and Renewable Energy Law (UU EBT) will be issued and the target is to use electric stoves for 2 million households per year. Furthermore, the development of interconnections, smart grids, and smart meters will be available in 2024, and the EBT mix will reach 23%, dominated by PLTS in 2025. The draft of the EBT Law is still being discussed between the government and the DPR.¹⁷ In 2027, the government will stop LPG imports. In 2030, 42% of EBT will be dominated by PLTS, the gas network will touch 10 million households, electric vehicles will reach 2 million cars and 13 million motorbikes, distribution of gas fuel will reach 300,000 kiloliters, utilization of Dymethyl Ether with electricity usage of 1,548 kWh/capita.¹⁸ The first phase of subcritical PLTU will experience early retirement in 2031 and there will be interconnection between islands starting from COD in 2035 with electricity consumption of 2,085 kWh/capita and an EBT mix reaching 57% dominated by PLTS, Hydro and Geothermal. In 2040, the EBT mix will reach 71%, and there will be no Diesel PLT operating, 70% LED lights, no sales of conventional motorbikes, and electricity consumption will reach 2,847 kWh/capita. In 2045, there is talk of building a Nuclear Power Plant (PLTN) with a capacity of 35 GW until 2060. The EBT mix is expected to reach 87% in 2050 accompanied by no sales of conventional cars and electricity consumption of 4,299 kWh/capita. Later in 2060 the mix EBT has reached 100%, dominated by PLTS and Hydro and accompanied by the distribution of gas networks to 23 million household connections, electric

¹⁷ Prismono, "This is the Road Map to Achieving Net Zero Emission" in <https://petrominer.com/ini-peta-jalan-capai-net-zero-emission/> accessed on 23 December 2023

¹⁸ Nyoman., Sukerayasa. "Overview of the Development of the World's Electric Vehicles Until Now". *Journal of Electrical Technology* volume 8 no. 1. Pg 15

stoves to 52 million households, the use of electric vehicles, and electricity consumption reaching 5,308 kWh/capita.¹⁹

The opportunity for an electric energy transition must be aligned with the principles of environmental sustainability, especially considering the ecological implications of large-scale infrastructure projects such as nickel mining, battery manufacturing, and charging station development. Although electric vehicles are widely regarded as a cleaner alternative to fossil fuel-based transportation, their production and disposal processes carry environmental risks if not properly managed under sound legal and environmental frameworks.²⁰

Hailes argues that a hierarchy privileging environmental protection “already runs through public international law and should be read into treaty clauses expressly.”²¹ In a detailed doctrinal map, Muinzer shows that “the United Kingdom now possesses one of the world’s densest climate-law frameworks, yet critical alignment gaps remain post-Brexit.”²²

Studies show that without strong legal oversight, the push for green energy may ironically lead to new environmental damages, particularly in regions rich in mineral resources.²³ Therefore, the energy transition policy must be integrated with environmental regulatory compliance and participatory governance that includes both central and regional actors.²⁴

¹⁹ Ishadi SK, "Preparing to Welcome Renewable Energy" in <https://news.detik.com/kolom/d-5782721/berprepared-menyongsong-energi-terbarukan> accessed on 23 December 2023

²⁰ Dewi Kurniawati, "Kebijakan Energi dan Tantangan Lingkungan dalam Transisi Energi di Indonesia," *Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional*, Vol. 10, No. 1, Tahun 2021, hlm. 45–60.

²¹ Hailes, Oliver. "Environmental Clauses in Investment Arbitration: Deep Roots, Green Shoots, and Dead Wood." *LSE Legal Studies Working Paper 17/2024* (2024).

²² Muinzer, Thomas L. "A Survey of Climate Change Law in the United Kingdom." *Climate Law* 14, nos. 3–4 (2024): 233–260.

²³ Budi Santoso, "Environmental Implications of Indonesia’s Nickel Mining for Electric Vehicle Batteries," *Jurnal Hukum & Pembangunan*, Vol. 50, No. 4, Tahun 2020, hlm. 1012–1028.

²⁴ Siti Aisyah, "The Role of Environmental Law in Supporting Green Investment Policy," *Pandecta: Jurnal Penelitian Ilmu Hukum*, Vol. 16, No. 2, Tahun 2021, hlm. 192–205.

III. Challenges of the Energy Transition in Indonesia Through the Use of Electric Vehicles

The development of the KBLBB ecosystem requires a large amount of financing, so it requires support from many sectors, including banking. Based on projections from the Ministry of BUMN, the investment value required to develop the KBLBB ecosystem is 13 - 17 billion USD, or the equivalent of IDR 182 - 238 trillion. Despite the many policies issued by the Government and regulators to support the growth of the KBLBB ecosystem from upstream to downstream, the facts reveal that the growth in sales of electric vehicles over the last three years is still very small, even though there was an increase during 2019-2021.

Several financing issues and commercial issues are challenges in the growth of electric vehicles, including the issue of the same credit interest between KBLBB and non-KBLBB, the absence of special interest incentives for KBLBB, the difficulty of determining collateral value, limited guarantee and insurance mechanisms for KBLBB, consumer behavior who do not yet believe in electric vehicle technology and batteries, the resale value of KBLBB, and the KBLBB secondary market which has not yet been formed because there is still a lack of electric vehicles in Indonesia. So despite use This KBLBB can save fuel costs by up to 71% and maintenance costs are 40% more efficient compared to non-KBLBB vehicles. With these financing issues, coupled with the price of electric cars, the largest component of which is the battery, this is a challenge in developing the electric vehicle ecosystem in Indonesia. The main thing is to do it to speed up ecosystem vehicle electricity in Indonesia. First , create battery with good quality . Second , multiply place charging Power or replacement battery . Third , improve quality product vehicle electricity domestically for the price the more economical However the quality Good .

The amount of SPKLU and SBKLU infrastructure is limited and still far from the availability target. According to data from the Ministry of Energy and Mineral Resources, as of September 2022, Indonesia only had 346 SPKLU units spread across 295 locations. This number is still very far from the target of 24,720 units for SPKLU availability in 2030. Currently the government, including the Ministry of Energy and Mineral Resources, is formulating changes to the Minister of Energy and Mineral Resources Regulation Number 13 of 2020 concerning Provision of Electric Charging Infrastructure for Battery-Based Electric Motorized Vehicles, to focus more on regulations regarding the type of technology. SPKLU, implementation of electricity tariffs, and integration of online applications in providing electricity charging infrastructure that is adapted to current conditions.

The results of the WTO panel decision recorded in the Dispute Settlement (DS) 592 dispute which decided that the Export policy and the Obligation to Process and Refining Nickel Minerals in Indonesia were proven to violate the provisions of WTO Article XI.1 GATT 1994 and could not be justified by Article XI.2 (a) and XX (d) GATT 1994. Apart from that, the panel also rejected the defense submitted by the Indonesian Government regarding the limited amount of National Nickel Reserves and implementing Good Mining Practice (Environmental Aspects) as the basis for the defense. Suppose the government loses, apart from having to compensate the party who wins the lawsuit. In that case, this defeat will also have an impact on the development of the electric vehicle ecosystem in Indonesia where nickel is an important component in developing batteries for electric vehicles, where the government has to import raw materials for electric batteries and raises doubts. for investors to build an electric vehicle ecosystem in Indonesia.

Waste electric car batteries are the biggest problem in the KBLBB program for road transportation considering that waste electric vehicle batteries are very dangerous for the environment. As sales of electric

vehicles continue to increase towards thousands of units per year and the usage life of electric batteries is still relatively short (electric motorbikes 3-5 years and electric cars 10-15 years), battery waste will become a scourge for the environment if it is not processed properly. . Various treatments for electric battery waste have been discussed, such as returning used batteries to the manufacturer, seller or battery collection facility provided, to using waste batteries to make building materials. However, until now, there is no electric battery recycling industry in Indonesia and no regulations governing the processing of electric vehicle battery waste.

Several legal issues related to improving the electric vehicle ecosystem in the future are as follows: First, data protection relating to data collected by vehicles can reveal the way we live and provide valuable insight into consumer behavior and actions. This could be a boon for an insurance industry that is increasingly paying attention to vehicle forensics: a digital forensic science focused on identifying, acquiring and analyzing automotive data. Whether collected through black boxes, electronic control units or other peripheral devices, this data is invaluable to insurance companies for various purposes, including acquisitions, new products (e.g. policies based on driver behavior) and developing proprietary databases that can be monetized. All these data flows are based on AI and blockchain; this is a risk regarding personal data protection regulations and follow-up in car insurance .

Second, the main raw material for electric car batteries is lithium metal. This metal is used in the form of lithium-ion (Li-ion) or lithium-polymer (Li-poly) and can be found in chemical compounds such as lithium cobalt oxide (LCO), lithium nickel manganese cobalt oxide (NMC), lithium manganese oxide (LMO), and lithium iron phosphate (LFP). Apart from lithium metal, electric car batteries also use other materials such as graphite for the negative electrode, and aluminum and copper for electrical conductors. Other materials, such as electrolytes, separators, and shields, are used in battery construction. It is important to

note that raw material resources for electric car batteries are limited and the production process can have environmental impacts. Therefore, the use of batteries and recycling used batteries will become a new issue that needs to receive early attention and ensure that electricity comes from “low carbon sources ”.

Fourth, taxes based on the current condition of motorized vehicles using the highway are subject to motor vehicle tax. To stimulate ownership of electric cars, the government passed Law Number 1 of 2022 on Financial Relations Between the Central Government and Regional Governments. In the HKPD Law, electric cars are said to be excluded as objects of motor vehicle tax (PKB) and BBNKB. In this way, electric cars can be free from the applicable PKB and BBNKB tariffs because they are included in the renewable energy-based motor vehicles category. It is estimated that there will be tax changes , where the road tax exemption for electric vehicles has a time limit. However, there must be a balance between generating income for the state and providing incentives for users of electric cars that do not produce GHG emissions, as regulated in Presidential Decree 98/2021 .

.....

The implementation of electricity transition policies in Indonesia brings significant environmental law challenges, particularly regarding the legal control of resource exploitation, pollution risks, and regulatory consistency. Although such policies aim to achieve sustainability, they often lack adequate legal mechanisms to ensure environmental protection across the entire energy value chain. According to legal scholars, one key issue lies in the gap between normative environmental obligations and enforcement in practice, especially at the regional level. Moreover, the lack of clarity in legal responsibilities related to environmental impact from electric vehicle battery waste presents another challenge. Without a clear

legal framework on the management, recycling, and disposal of battery waste, the electricity transition may generate new environmental hazards. In addition, the principle of sustainable development—mandated in environmental law—requires that green policies not only aim for carbon reduction but also ensure ecological justice and intergenerational equity. Dominioni and Martínez Romera contend that the IMO’s 2023 strategy “borrows equity principles straight from the Paris regime, signalling a jurisprudential convergence across forums.”

To address these challenges, legal reforms should strengthen environmental licensing, monitoring, and accountability mechanisms within energy-related sectors, ensuring that the transition to electricity does not compromise environmental integrity.

IV. Government as role models use vehicle motorized electricity based battery

A critical examination of Presidential Instruction No. 7/2022 and Presidential Decree No. 112/2022 from the perspective of regional autonomy and environmental impact reveals a regulatory gap. These instruments are top-down in nature and do not fully integrate local government authority in environmental decision-making, potentially conflicting with the decentralized legal framework under Law No. 23 of 2014. In addition, major projects under the electric vehicle ecosystem such as battery production, nickel mining, and charging infrastructure raise significant environmental concerns. Based on the precautionary principle in environmental law, every energy transition project should undergo a mandatory Environmental Impact Assessment (AMDAL) or Strategic Environmental Assessment (KLHS), especially if it affects natural

resources at the regional level.²⁵ However, current regulations lack strict implementation mechanisms to enforce these requirements in the context of green infrastructure. The absence of environmental analysis risks undermining sustainability and violating the principles of environmental law such as intergenerational equity and polluter-pays.²⁶ Therefore, strengthening environmental legal frameworks and impact analysis procedures becomes crucial to ensuring that green energy development remains environmentally accountable.²⁷

The Indonesian state is run by the government, then government so will become a role model for its people. A role model is one who can set a good example to others. This refers to the 1945 Constitution Article 33 paragraph (3): Earth and water and wealth nature contained therein controlled by the state and used for big prosperity people. That source energy from Indonesian nature must government process for prosperity people so that government must prove one of them is how the process works with product law on every its policy.

Policy Central Government Regarding the Acceleration of the Battery-Based Electric Motor Vehicle (KBLBB) Program for Road Transportation

Table 4

Presidential Decree No. 55/2029 jo. Presidential Decree No.79/2023	Acceleration of the KBLBB (Battery Electric Vehicle) Program for Road Transportation
Presidential Instruction No.7/2022	Use of KBLBB as an Operational Service Vehicle and/or Individual Service Vehicle

²⁵ Hadi Supeno, "Implementasi Prinsip Kehati-hatian dalam Hukum Lingkungan di Indonesia," *Jurnal Hukum dan Pembangunan*, Vol. 51, No. 2, Tahun 2021, hlm. 235–250.

²⁶ Nurliah, "Prinsip Pembangunan Berkelanjutan dalam Kebijakan Energi di Indonesia," *Jurnal Rechts Vinding*, Vol. 9, No. 1, Tahun 2020, hlm. 113–127.

²⁷ M. Irfan dan R. Zulfikar, "Analisis Hukum terhadap Kewajiban AMDAL dalam Proyek Strategis Nasional: Studi Kasus Industri Nikel," *Jurnal Hukum IUS*, Vol. 10, No. 2, Tahun 2022, hlm. 276–290.

	for Central Government and Regional Government Agencies
Minister of Investment Regulation No.6/2023	Guidelines and Governance for Providing Import Incentives and/or Handing Over KBLBB Four Wheels in the Context of Accelerating Investment
Minister of Finance Regulation No.8/2024	Value Added Tax borne by the Government for Fiscal Year 2024 for electric cars
ESDM Ministerial Regulation No.1/2023	Provision of Electric Charging Infrastructure for Battery-Based Electric Motor Vehicles and charging rates
Minister of Energy and Mineral Resources Regulation No. 13 of 2023 concerning change on Ministry of Energy and Mineral Resources Number 3 in 2023	General Guidelines for Government Assistance in the Program for Converting Motorcycles with Combustion Motor Drives to Battery-Based Electric Motorcycles . IDR 10 million incentive for per unit of electric motor conversion
Industry Ministry Number 21 About Changes to Industrial Regulations Number 6 of 2023 of 2023	1 Number Parent Population = 1x buy an electric motorbike new with incentive Rp. 7 million
Industry Ministry Number 28 of 2023	specifications , maps road TKDN development and provisions for KBLBB
Industry Ministry number 29 of 2023	KBLBB in circumstances decompose complete and unraveled No complete

Circular letter Minister of Home Affairs Number 024/4833/SJ	Acceleration Vehicle Program Implementation Electric Motor Based Battery For Road Transport
---	---

Policy government areas related to accelerating the battery-based electric motor vehicle program for road transport

Table 5

DK Jakarta	Regulation Special Region Governor Capital City of Jakarta Number 3 of 2020 About Vehicle Title Transfer Tax Incentive Motorized Vehicles Electric Motor Based Battery (Battery Electric Vehicle) For Road Transport
West Java ²⁸	Regional Secretary Circular Letter to Heads of Regional Apparatus, Number: 3103/RT.05.01/PEREK regarding Instructions for Using KBLBB within the West Java Provincial Government (2022) Menu for renting and buying electric vehicles in local and national e-Catalogs (2022) Implementation of official electric vehicles in provincial regional apparatus (2023) Exploration of cooperation in developing the electric vehicle ecosystem (SPKLU and SPBKLU) (2022-2023) Use 4 wheeled KBLBB as operational Governor , Deputy Governor , and Patwal .

²⁸ Implementation of Battery Based Electric Motorized Vehicles - KBLBB in West Java, https://esdm.jabarprov.go.id/desdm_jabar/books/pdf/KBLBB%202023.pdf

	Placement of SPKLU in the Gedung Sate area, and development of SPKLUL by PLN in UP3 Bandung and Cipali Toll rest area. BBNKB KBLBB incentives based on Regional Regulation no 9 of 2019 concerning Regional Taxes (R4 10% and R2 2.5%) Installation of battery exchange stations (battery exchanger (BEx)) at 26 points in Bandung City Free PCX electric rental from PT. The HEIN used by the West Java Provincial Government is 6 units and the Bandung City Government is 22 units. Grant of 1 electric TVS unit to the West Java Provincial Government.
South Sumatra	Governor's Regulation South Sumatra Province Number 26 of 2021 Use of Battery-Based Electric Motorized Vehicles
Bali	Regulation Mayor of Denpasar Number 40 of 2023 concerning Use Vehicle Electric Motor Based Battery
East Java	Regulation Governor East Java Province Number 9 of 2023 Usage Vehicle Electric Motor Based Battery As Operational Service Vehicles and/or Vehicles Service Individual
Yogyakarta	Regulation Mayor of Yogyakarta City Number 71 of 2022 Usage Vehicle Certain with Use Electric Motor Drive

The existence of Presidential Instruction Number 7 of 2022 concerning the Use of Battery-Based Electric Motorized Vehicles as

Operational Service Vehicles and/or Individual Service Vehicles for Central Government and Regional Government Agencies was then adjusted in the Minister of Finance Regulation or PMK Number 49 of 2023 Standards for Input Costs for Fiscal Year 2024. One of them It contains input cost standards for the procurement of [electric vehicles](#) for echelon I and II officials, as well as civil servants or civil servants. The attachment section to the regulation states that the nominal cost for procuring [electric motorbikes](#) is a maximum of IDR 28 million per unit. Meanwhile, electric vehicles for office operations are budgeted for a maximum of IDR 430,080,000 or IDR 430 million per unit. Meanwhile, the budget for [electric cars](#) for echelon I officials is a maximum of IDR 966,804,000 per unit or almost IDR 1 billion per unit. Meanwhile, electric vehicles for echelon II officials are a maximum of IDR 746,110,000 per unit or around IDR 746 million per unit. Specifically, the procurement of official vehicles in the form of battery-based electric motorized vehicles (KBLBB) does not include the costs of delivery and charging installations. In Presidential Instruction 7/2022, it is stated that the use of electric vehicles as official vehicles can be carried out through a vehicle purchase, rental and/or conversion scheme. fuel-based to battery-based electric vehicles by statutory provisions. Procurement of battery-based electric motorized vehicles as official vehicles refers to the requirements of laws and regulations regarding the procurement of government goods or services

Presidential Instruction is form regulation policies that don't can categorized as form regulation legislation . Presidential Instruction formally no can called as official regulations . It's like letter circular from the Minister or Director Addressed general to ranks existing civil servants in scope not quite enough he answered . Used it policy class Presidential Instruction too, perhaps answer Why There is head area so brave reject policy the in a way open Because of course Presidential Instruction No enter in hierarchical mandatory regulations obeyed . Apart from the fact

that the budget required is very large , Jokowi's policy goes through The Presidential Instruction, which is also of a nature only as directions .

Chinese investment supports ecosystem vehicle impact electricity to many station charging battery for vehicle electricity service government area

Indonesia must adapt with policy trends leading world trade to geopolitical fragmentation for obtain optimal benefits, such as looking at the dominance of China-US – EU

Table 6

China	US	E.U
China own superiority in mastery technology in matter critical mineral processing and capital provision . Indonesia has obtain significant benefits from cooperation with China in mineral downstream . However , the domestic market China in the sector downstream Enough limited Because factor tight competition . Need expansion market access	The US has superiority Huge market access domestically , though in a way technology in critical mineral processing Enough left behind with China . However , US policy is implemented rates and IRAs through foreign entity of concern (FEOC) apply limitation to originating product from China . Therefore the Critical Mineral Agreement	The EU has superiority market access however Still left behind in mastery technology compared to China . Policy protectionism through potential green policies creates a barrier against products From Indonesia. However , policy tariff to China potential benefit Indonesia. Indonesia is moderate CEPA finalization for expansion market access

	with the US became important	
--	---------------------------------	--

Chiu critiques the EU draft Regulation for “both over- and under-inclusive scoping that could blunt the regime’s green-washing deterrence.”²⁹

In October 2023, President mentioned China would become the main investor in Indonesia One until two year to front and as FDI (Foreign Direct Investment) contributor in Indonesia during the Indonesia-China Business Forum in Beijing, China. In 2022 , 147 countries including Indonesia will be recorded signed a Memorandum of Understanding (MoU) for the project cooperation with China below umbrella of the Belt and Road Initiative³⁰ Leonelli warns that “securitising critical-minerals policy risks under-cutting the very trade leverage needed to accelerate global decarbonisation.”³¹

This cooperation reflects Indonesia’s openness to Chinese capital in strategic sectors, including electric vehicle infrastructure and renewable energy industries.³² However, this must be accompanied by strict environmental governance to ensure that Chinese-led investment projects comply with national environmental law and sustainability principles.³³

Based on data from the Ministry of Energy and Mineral Resources, projections production For ore nickel saprolite in 2026 will amount to 360 million tons/ year so that age the backup only remaining ± 9 years ,

²⁹ Chiu, Iris H-Y. “Regulating ESG Rating and Data Product Providers: Critically Examining EU Regulation through the Lens of Functional Regulatory Consistency.” *European Journal of Risk Regulation* 16 (2025): 242-262.

³⁰ CNBC Indonesia, “Jokowi: China Will Be RI’s Main Investor in the Next 1-2 Years”, *CNBC Indonesia*, 18 Oktober 2023, diakses dari: <https://www.cnbcindonesia.com/news/20231018133332-4-485203/jokowi-china-akan-jadi-investor-utama-ri-1-2-tahun-ke-depan-pada-14-Februari-2024>.

³¹ Leonelli, Giulia Claudia. “Critical Raw Materials, the Net-Zero Transition and the ‘Securitization’ of the Trade–Climate Nexus.” *World Trade Review* 24, no. 1 (2025): 1-20.

³² Arif Hidayat, “Legal Review of Chinese Investment in Indonesia’s Renewable Energy Sector,” *Jurnal Hukum & Pembangunan*, Vol. 52, No. 1, Tahun 2022, hlm. 112–128.

³³ Luthfi Rahman, “Environmental Governance and the Belt and Road Initiative: A Legal Perspective from Indonesia,” *Jurnal Hukum IUS*, Vol. 10, No. 3, Tahun 2022, hlm. 489–504.

meanwhile For ore nickel limonite projection production in 2026 will be 51 million tons / year and still own age reserve up to ± 30 years . That moment This There are 137 of the 248 nickel smelter furnaces in Indonesia that are affiliated with china . Entity business large companies engaged in industry nickel with proportion large capital accumulation that is namely PT Vale Indonesia Tbk , Tsinghan (IMIP and IWIP), PT Bintang Empat Mineral (IMIP), Jiangsu Delong Nickel (Dragon Virtue), Harits & Lygend Resources, Contemporary Amperex Technology Ltd. (CATL), LG Corporation Zhejiang Huayou Cobalt, Pohang Iron and Steel Company (Posco), and finally Kalla Group ³⁴.

For support use vehicle electricity in Indonesia, government through the State Electricity Company (PLN) has build more of the 150 SPKLU available throughout Indonesia. The goal is For makes it easier owner vehicle electricity in fill in repeat Power battery his vehicle . For supports this program , the government has also build lots of SPKLU and SPLU. By general , SPLU and SPKLU are the same is station charging Power For battery vehicle electricity . It's just that SPLU can used For Lots need start from fill in Power motorbike battery up to need street vendor . Meanwhile, SPKLU is specialized For charging Power battery vehicle electricity .

SPKLU moment This majority installed on the islands of Java (72%) and Sumatra (12%)

Table 7

Charging Stations (SPKLU)	units
UltraFast (>50Kw)	150
Fast (22-50Kw)	239
Medium (7-22Kw)	445

³⁴ <https://finance.detik.com/industri/d-7131929/investor-china-ramai-ramai-investasi-nikel-di-ri-ini-besarnya>

Slow (<7Kw)	546
Total:	1,380

Source : PLN Dit Retail Commerce , Apr 2024

Remember a number area , fixed provide infrastructure , even classified Ready For infrastructure vehicle electricity service . Size infrastructure ecosystem vehicle electricity said Ready is availability infrastructure station exchange battery vehicle electricity general public (SPBKLU) every 5 kilometers (km) for dense areas resident . Capable area provide This namely DKI Jakarta, West Java, Central Java, East Java, Yogyakarta and Bali. For areas that haven't Ready the infrastructure is necessary pushed , start from regulation head area provide budget . At a minimum, deep One area budget For build . According to count , in One area Can up to 200 SPBKLU. Therefore if investment China on the project battery vehicle electricity in a way evenly distributed in Indonesia which will also be build SPBKLU to encourage convenience government area in prepare use vehicle electricity service . Government as example will increase perception society is back and massive vehicle electricity in Indonesia follows China's example push effectiveness transition energy

V. Conclusion

The legal issue addressed in this study concerns the effectiveness and enforceability of Presidential Instruction No. 7 of 2022 as a legal instrument in accelerating the adoption of battery-based electric vehicles (KBLBB) at the regional level, and its alignment with regional autonomy and environmental protection principles. The findings show that although the central government has issued a number of legal frameworks to support the energy transition, including Inpres No. 7/2022, its non-binding nature and the decentralized governance structure pose significant legal and practical challenges. From the perspective of regional autonomy, the

implementation of KBLBB policies in local governments is uneven due to the absence of coercive legal mechanisms and the high dependency on regional fiscal capacity. In addition, although environmental law principles such as sustainable development, environmental justice, and the precautionary principle should guide the transition, many infrastructure and investment projects still operate with minimal environmental safeguards. Therefore, to ensure the legal consistency and success of the energy transition agenda, it is recommended that Presidential Instruction No. 7 of 2022 be strengthened by elevating its status to a binding regulation, such as a Government Regulation or Presidential Regulation. The 2024 Presidential Regulation has officially dissolved the Coordinating Ministry for Maritime Affairs and Investment, resulting in a reconfiguration of responsibilities across new coordinating ministries, particularly the Coordinating Ministry for Food Security and the Coordinating Ministry for Infrastructure and Regional Development. In the context of electric vehicle infrastructure and energy transition, this restructuring necessitates renewed coordination among sectoral ministries such as the Ministry of Energy and Mineral Resources under the Coordinating Ministry for Economic Affairs, and the Ministry of Transportation and Ministry of Environment under different coordinating umbrellas while also requiring investors, especially from China, to adapt to the evolving institutional landscape to ensure regulatory compliance and policy alignment. Moreover, central government should establish a mandatory framework for local governments to conduct environmental impact assessments and provide fiscal and infrastructure support especially through Chinese investment partnerships so that the electric vehicle ecosystem can be developed equitably and sustainably across Indonesia.

References

- Indonesia. *Circular Letter of the Minister of Home Affairs No. 024/4833/SJ on the Acceleration of the Battery-Electric Vehicle Programme* (2023).
- . *Governor Regulation of Bali No. 40/2023 on the Use of Battery-Electric Motor Vehicles*.
- . *Governor Regulation of East Java No. 9/2023 on the Use of Battery-Electric Motor Vehicles as Operational Service Cars*.
- . *Governor Regulation of South Sumatra No. 26/2021 on the Use of Battery-Electric Motor Vehicles*.
- . *Governor Regulation of the Special Capital Region of Jakarta No. 3/2020 on Transfer-Tax Incentives for Battery-Electric Vehicles*.
- . *Law No. 1/2022 on Fiscal Relations between Central and Regional Governments*.
- . *Law No. 23/2014 on Local Government*.
- . *Minister of Energy and Mineral Resources Regulation No. 1/2023 on Provision of Charging Infrastructure for Battery-Electric Vehicles*.
- . *Minister of Energy and Mineral Resources Regulation No. 11/2019 on the Restriction of Nickel-Ore Exports*.
- . *Minister of Energy and Mineral Resources Regulation No. 13/2023 amending Regulation No. 3/2023 on Government Assistance for Motorcycle Conversion*.
- . *Minister of Finance Regulation No. 8/2024 on Government-Borne Value Added Tax for Electric Cars*.
- . *Minister of Finance Regulation No. 49/2023 on Standard Input Costs (Electric-Vehicle Procurement)*.
- . *Minister of Investment Regulation No. 6/2023 on Import Incentives for Four-Wheeled Battery-Electric Vehicles*.
- . *Ministry of Industry Regulation No. 21/2023 amending Regulation No. 6/2023 (Incentives for New Electric Motorcycles)*.

- . *Ministry of Industry Regulation No. 28/2023 on Technical Specifications and TKDN Road-Map for Battery-Electric Vehicles.*
- . *Ministry of Industry Regulation No. 29/2023 on Completely Knocked-Down and Incomplete Battery-Electric Vehicles.*
- . *Presidential Decree No. 55/2019 on the Acceleration of the Battery-Electric Vehicle Programme for Road Transportation, jo. Presidential Decree No. 79/2023.*
- . *Presidential Decree No. 98/2021 on the Economic Value of Carbon.*
- . *Presidential Decree No. 112/2022 on the Acceleration of Renewable Energy Development.*
- . *Presidential Instruction No. 7/2022 on the Use of Battery-Electric Motor Vehicles as Government Fleet Cars.*
- . *Regional Regulation of West Java No. 9/2019 on Regional Taxes (EV incentives).*

Books

- Ahmad, Tauhid, Andry Satrio Nugroho, and Dinda Maharani. *Development of Battery-Based Electric Cars in Indonesia*. INDEF Policy Brief No. 5/2022. Jakarta, May 2022.
- Asshiddiqie, Jimly. *Introduction to Constitutional Law*. Jakarta: Rajawali Pers, 2019.
- Indrati, Maria Farida. *The Science of Legislation: Types, Functions, and Material Content*. Yogyakarta: Kanisius, 2007.
- Marzuki, Peter Mahmud. *Penelitian Hukum*. Jakarta: Kencana, 2010.
- Soekanto, Soerjono. *Pengantar Penelitian Hukum*. Jakarta: UI Press, 2006.
- West Java Energy and Mineral Resources Office. *Implementation of Battery-Based Electric Motorised Vehicles (KBLBB) in West Java*. Bandung, 2023.
https://esdm.jabarprov.go.id/desdm_jabar/books/pdf/KBLBB%202023.pdf (accessed 23 December 2023).

Journal Articles

- Aisyah, Siti. "The Role of Environmental Law in Supporting Green-Investment Policy." *Pandecta* 16, no. 2 (2021): 192-205.
- Banzragch, Tzolmon. "An Analysis of the Climate-Change Legal Regime in Mongolia." *Chinese Journal of Environmental Law* 9, no. 1 (2025): 48–87.
- Bhattacharya, Aniket. "Sector-Specific Carbon Taxes: Lessons for Emerging Economies." *Climate Law* 14, no. 2 (2024): 65-92.
- Boxall, Naomi J., et al. "Urban Mining of Lithium-Ion Batteries in Australia: Current State and Future Trends." *Minerals Engineering* 128 (2018): 45-55.
- Chiu, Iris H-Y. "Regulating ESG Rating and Data Product Providers: Critically Examining EU Regulation through the Lens of Functional Regulatory Consistency." *European Journal of Risk Regulation* 16 (2025): 242-262.
- Cocciolo, Endrius, and Leonie Reins. "A Critical Review of the Energy Charter Treaty from an Earth System-Law Perspective." *Transnational Environmental Law* 14, no. 1 (2025): 94-120.
- Dominioni, Goran, and Beatriz Martínez Romera. "The 2023 IMO Greenhouse-Gas Strategy: Considerations of Equity." *International Journal of Marine and Coastal Law* (ahead-of-print, 2025).
- Galvis, Juan Pablo. "Measuring It, Managing It, Fixing It? Data and Rights in Transnational and Local Climate-Change Governance." *Transnational Environmental Law* 13, no. 2 (2024): forthcoming.
- Hailes, Oliver. "Environmental Clauses in Investment Arbitration: Deep Roots, Green Shoots, and Dead Wood." *LSE Legal Studies Working Paper* 17/2024 (2024).
- Irfan, M., and R. Zulfikar. "Analisis Hukum terhadap Kewajiban AMDAL." *Jurnal Hukum IUS* 10, no. 2 (2022): 276-290.

- Kurniawati, Dewi. “Kebijakan Energi dan Tantangan Lingkungan dalam Transisi Energi di Indonesia.” *Jurnal Rechts Vinding* 10, no. 1 (2021): 45-60.
- Leonelli, Giulia Claudia. “Critical Raw Materials, the Net-Zero Transition and the ‘Securitisation’ of the Trade–Climate Nexus.” *World Trade Review* 24, no. 1 (2025): 1-20.
- Muinzer, Thomas L. “A Survey of Climate-Change Law in the United Kingdom.” *Climate Law* 14, nos. 3-4 (2024): 233-260.
- Mulyadi, Lilik. “Aspek Hukum Pengelolaan Limbah Baterai Kendaraan Listrik.” *Jurnal Hukum IUS* 9, no. 3 (2021): 489-503.
- Nappert, Sophie. “ESG Conditionality in Development Finance.” *International & Comparative Law Quarterly* 73, no. 1 (2024): 105-135.
- Noviani, Rani. “Prinsip Pembangunan Berkelanjutan dalam Kebijakan Energi Baru dan Terbarukan.” *Pandecta* 15, no. 1 (2020): 67-80.
- Nyoman, Sukerayasa. “Overview of the Development of the World’s Electric Vehicles Until Now.” *Journal of Electrical Technology* 8, no. 1 (2019): 15-22.
- Parra, Juan. “Federalism and Renewable-Energy Deployment in Mexico.” *Energy Policy* 171 (2023): 113243.
- Redi, Ahmad. “Problematika Penegakan Hukum Lingkungan dalam Kebijakan Energi Nasional.” *Jurnal Legislasi Indonesia* 17, no. 2 (2020): 210-222.
- Santoso, Budi. “Environmental Implications of Indonesia’s Nickel Mining for Electric-Vehicle Batteries.” *Jurnal Hukum & Pembangunan* 50, no. 4 (2020): 1012-1028.
- Supeno, Hadi. “Implementasi Prinsip Kehati-hatian dalam Hukum Lingkungan.” *Jurnal Hukum dan Pembangunan* 51, no. 2 (2021): 235-250.

Reports, Surveys & Technical Data

PWC. *Indonesia EV Consumer Survey* (2023).

US Geological Survey. *Mineral Commodity Summary: Nickel* (2019).

News & Web Sources

———. “Ministry of Investment Oversees Integrated Electric-Battery Project.” 13 February 2024. <https://www.antaranews.com/...> (accessed 13 February 2024).

Adira Finance. “What Are the Advantages and Disadvantages of Electric Vehicles?” 13 February 2024. <https://www.adira.co.id/...> (accessed 13 February 2024).

Antara. “Banking Targets Financing Potential for Electric-Vehicle Ecosystem.” 23 December 2023. <https://www.antaranews.com/...> (accessed 23 December 2023).

Asmara, Chandra Gian. “Jokowi Reveals 3 Big Challenges of Energy Transition.” *CNBC Indonesia*, 17 March 2022. <https://www.cnbcindonesia.com/...> (accessed 23 December 2023).

CNBC Indonesia. “Jokowi: China Will Be RI’s Main Investor in the Next 1–2 Years.” 18 October 2023. <https://www.cnbcindonesia.com/...> (accessed 14 February 2024).

Indonesiabaik.id. “Electric-Vehicle Charging Stations in Indonesia.” 23 December 2023. <https://indonesiabaik.id/...> (accessed 23 December 2023).

Information and Documentation Management Officer, Ministry of Environment and Forestry. “Enhanced NDC: Indonesia’s Commitment to Contribute More to Maintaining Global Temperatures.” 13 February 2024. <https://ppid.menlhk.go.id/...> (accessed 13 February 2024).

Ishadi, S.K. “Preparing to Welcome Renewable Energy.” *Detik News*, 18 November 2021. <https://news.detik.com/...> (accessed 23 December 2023).

Kompas Video. "189,803 Government Vehicles Will Be Replaced by Electric Cars." 2 April 2023. <https://video.kompas.com/...> (accessed 23 December 2023).

Ombudsman RI. "Pemerintah Pusat–Daerah Harus Sinkron" n.d. <https://ombudsman.go.id/...> (accessed 23 December 2023).

Petrominer. Prismono. "This Is the Road Map to Achieving Net Zero Emission." 23 December 2023. <https://petrominer.com/...> (accessed 23 December 2023).

Ramadhan, Fardhal. "Raw Materials for Electric-Car Batteries." ULVAC Indonesia, 23 December 2023. <https://www.ulvac.co.id/...> (accessed 23 December 2023).

Revo M. "Anies–Prabowo–Ganjar’s Dream of the EV Industry." *CNBC Indonesia*, 24 January 2024. <https://www.cnbcindonesia.com/...> (accessed 25 January 2024).

Revo M., "This is Anies-Prabowo-Ganjar’s Dream About the Indonesian Electric Vehicle Industry," *CNBC Indonesia*, accessed from: <https://www.cnbcindonesia.com/research/20240124081907-128-508489/begini-bisnis-anies-prabowo-ganjar-soal-electric-vehicle-industry-ri> on 25 January 2024.

Tauhid Ahmad, Andry Satrio Nugroho, and Dinda Maharani, *Development of Battery-Based Electric Cars in Indonesia*, INDEF Policy Brief No. 5/2022, May 2022.

West Java Energy and Mineral Resources Office, *Implementation of Battery-Based Electric Motorized Vehicles (KBLBB) in West Java*, accessed from: https://esdm.jabarprov.go.id/desdm_jabar/books/pdf/KBLBB%202023.pdf.

DECLARATION OF CONFLICTING INTERESTS

The authors state that there is no conflict of interest in the publication of this article.

FUNDING INFORMATION

None

ACKNOWLEDGMENT

None

HISTORY OF ARTICLE

Submitted : August 19, 2024

Revised : April 14, 2025

Accepted : May 12, 2025

Published : June 16, 2025