

Legal Regulation of Electric Vehicles in Indonesia: Challenges and Directions of National Policy

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Abstract: *The global energy paradigm shift is driving the transformation of the transportation sector, where electric vehicles are seen as a strategic solution to reduce dependence on fossil fuels and reduce carbon emissions. Indonesia, through its commitment to net zero emissions 2060, has responded to this issue by issuing key regulations, namely Presidential Regulation 55 of 2019 and Presidential Regulation 79 of 2023. Presidential Decree 79/2023 expands the scope of policies, not only focusing on accelerating the adoption of electric vehicles, but also emphasizing industrialization, supply chain development, fiscal incentives, and infrastructure acceleration. However, this regulation is not yet fully in sync with Law 22 of 2009 concerning Road Traffic and Transportation, which is still oriented towards fossil fuel vehicles. This condition creates a regulatory gap in the aspects of type tests, safety standards, and battery waste management. Therefore, regulatory harmonization is absolutely necessary so that electric vehicles can operate legally, safely, and sustainably. This study uses a normative juridical method with a legislative, conceptual, and comparative approach, to examine the integration of Presidential Regulation 79/2023 with Law 22/2009. The analysis was carried out in a descriptive-analytical manner to find strengths, weaknesses, and needs for regulatory reform. The results of the research are expected to make a real contribution to the direction of national legal policies that are consistent, adaptive, and support the sustainable energy transition in Indonesia.*

Keywords: *Electric Vehicles; Energy Transition; Harmonization of Regulations*

INTRODUCTION

The change in the global energy paradigm has had a significant impact on the transportation sector, including Indonesia as one of the developing countries with a high level of energy consumption. Fossil fuel vehicles have been a major contributor to air pollution and carbon emissions that contribute to climate change. Along with increasing awareness of the environmental crisis, electric vehicles are starting to be seen as a more environmentally friendly solution. Indonesia, as part of the international community, has expressed its commitment to achieving *net zero emissions* by 2060. This commitment certainly requires policy transformation in the transportation sector as one of the largest energy users. Thus, electric vehicles

are a strategic issue that is not only technical, but also has complex legal and policy dimensions.¹ Therefore, it is important to examine more deeply the aspects of legal regulation.

The Government of Indonesia has responded to this issue through the issuance of a number of regulations, one of which is Presidential Regulation Number 55 of 2019 concerning the acceleration of the battery-based electric motor vehicle program. This regulation is the initial foothold that marks the government's seriousness in encouraging the electric vehicle ecosystem.² However, the implementation of the regulation still faces various obstacles, especially related to technical clarity and consistency of implementation. Producers, investors, and consumers are still dealing with legal uncertainty due to derivative rules that are not yet comprehensive. This shows that the existence of macro regulations alone is not enough without being followed by adaptive technical details. Legal certainty in the development of electric vehicles is the key so that all stakeholders feel protected. Therefore, this research is important to examine the challenges that are still faced in the legal aspects of electric vehicles in Indonesia.

As a reinforcement, the government issued Presidential Regulation Number 79 of 2023 concerning the acceleration of the development of the battery-based electric motor vehicle industry in Indonesia. This Presidential Regulation affirms the national industrialization strategy by emphasizing the development of supply chains, the provision of incentives, and the acceleration of supporting infrastructure. This expands the scope of Presidential Regulation 55 of 2019, which was originally more oriented towards accelerating use, to a policy that also views electric vehicles as a motor of economic growth.³ However, the implementation of Presidential Regulation 79 of 2023 still requires harmonization with other sectoral regulations so as not to cause overlap. Weaknesses in inter-agency coordination have the potential to reduce the effectiveness of these already progressive regulations. Therefore, the analysis of these new regulations is important to test the extent to which it can encourage consistency in the direction of national policies. That way, the regulations that are born are not only normative, but also functional in practice.

In the context of operations on the highway, electric vehicles also cannot be separated from the legal framework of Law Number 22 of 2009 concerning Road Traffic and Transportation. This law is the basis for traffic regulation in general, including the technical requirements of motor vehicles. However, the existing arrangement is still oriented towards conventional fossil fuel vehicles so it does not fully accommodate the characteristics of electric vehicles. For example, aspects of type tests, safety standards, and protection against battery fire risk have not been regulated in detail. This creates *a regulatory gap* that has the potential to hinder the integration of electric vehicles into the national traffic system.⁴

¹ Sidabutar, V. T. P. (2020). Kajian pengembangan kendaraan listrik di Indonesia: prospek dan hambatannya. *Jurnal Paradigma Ekonomika*, 15(1), 21-38.

² Nuarta, I. N., & Sukedi, M. (2024). Kebijakan Hukum Pengaturan Penggunaan Kendaraan Listrik Dalam Penguatan Ketahanan Energi Nasional. *Jurnal Preferensi Hukum*, 5(2), 145-154.

³ Nur, A. I., & Kurniawan, A. D. (2021). Proyeksi masa depan kendaraan listrik di Indonesia: analisis perspektif regulasi dan pengendalian dampak perubahan iklim yang berkelanjutan. *Jurnal Hukum Lingkungan Indonesia*, 7(2), 197-220.

⁴ Prasyanti, M. D., & Kartika, A. W. (2025). Urgensi Pembentukan Undang-undang Khusus Kendaraan Bermotor Listrik Berbasis

Harmonization between the Presidential Regulation and the LLAJ Law is absolutely necessary so that electric vehicles can operate legally, safely, and safely.⁵ Thus, legal certainty is not only present at the industry level, but also at the road user level.

The main challenges in the legal regulation of electric vehicles remain closely related to infrastructure and technical standardization. The construction of charging stations, battery safety arrangements, and battery waste recycling mechanisms are strategic issues that require clear regulations.⁶ If this is not properly regulated, then the risk of accidents, pollution, or even a new energy crisis can arise. In the legal context, technical regulation is not just an administrative matter, but an instrument of community protection. The experience of other countries shows that regulatory failures on technical aspects can significantly hamper the growth of the electric vehicle market. Therefore, Indonesia needs to learn from international practices to strengthen its legal framework. Thus, the sustainability of the electric vehicle ecosystem can be ensured more comprehensively.

In addition to technical challenges, national policies in the development of electric vehicles are also related to fiscal and economic aspects. Tax incentives, subsidies, and component import policies are factors that greatly determine the attractiveness of the electric vehicle market.⁷ However, without synchronous regulations between agencies, these policies have the potential to cause uncertainty for industry players. Regulatory inconsistencies can also create bureaucratic obstacles that are counterproductive to the acceleration of electric vehicles. Therefore, regulatory harmonization is an urgent need that must be fulfilled by the government. Consistent legal arrangements will create public trust and certainty for investors. At this point, the direction of national policy towards electric vehicles must be seen comprehensively and integrated.

In the dimension of consumer protection, electric vehicles present quite serious legal challenges. Consumers have the right to be assured of security, safety, and clear information about the products they use. However, until now there is no special regulation that details the responsibility of electric vehicle manufacturers in the event of losses due to product defects. This condition creates a legal loophole that can harm consumers in the future. Consumer protection must be an important part of the legal regulation of electric vehicles in order to create justice. If not, then the electric vehicle acceleration program can cause resistance from the community. Therefore, this aspect needs to be a concern in the direction of national legal policy.

In addition to consumer protection, the legal regulation of electric vehicles is also closely related to the management of natural resources. Indonesia has huge reserves of nickel, which is the main raw material for

⁵ Robertua, V., Oktavian, R., Hermawan, P. A., Nainggolan, F., & Avrielia, T. (2024). Solusi Palsu dalam Implementasi Perjanjian Paris di Indonesia: Studi Kasus Percepatan Program Kendaraan Listrik Berbasis Baterai di Jakarta. *AEGIS: Journal of International Relations*, 8(1).

⁶ Jati, S. A. K. (2024). Dinamika Hukum Dalam Pengembangan Energi Baru Terbarukan Di Indonesia: Tinjauan Terhadap Aspek Regulasi Dan Implementasinya Dalam Pembangunan Infrastruktur Energi Berkelanjutan. *Jurnal Legal Reasoning*, 6(2), 89-101.

⁷ Maghfiroh, M. F. N., Pandiyaswargo, A. H., & Onoda, H. (2021). Current readiness status of electric vehicles in indonesia: Multistakeholder perceptions. *Sustainability*, 13(23), 13177.

electric vehicle batteries.⁸ This potential can be a strategic opportunity to make Indonesia the center of the global electric vehicle industry. However, without regulations that regulate supply chain governance in a sustainable manner, these opportunities can turn into an environmental burden. Uncontrolled exploitation of resources has the potential to cause new problems in the long run. Therefore, laws must be present to regulate the balance between economic utilization and environmental sustainability. Thus, electric vehicles are truly part of sustainable development, not just a momentary trend.

Based on the dynamics that have been described, the urgency of the legal study of electric vehicles in Indonesia is becoming clearer. This research not only examines existing regulations, but also analyzes challenges and provides more comprehensive policy directions. The novelty of this study lies in the approach that emphasizes the integration between technical aspects, consumer protection, and national policies, especially through the integration of Presidential Decree 79 of 2023 and Law Number 22 of 2009.⁹ Thus, this research seeks to make a real contribution to the development of legal literature while supporting Indonesia's energy transition agenda. It is hoped that the results of this research can be a reference for policymakers in formulating adaptive regulations. Strong regulations will provide legal certainty and accelerate the transformation towards electric vehicles. Ultimately, electric vehicles can truly become an important pillar in Indonesia's sustainable legal and economic development.

METHOD

This research uses a normative juridical method, namely legal research that focuses on the study of applicable positive legal norms, legal principles, and relevant legal doctrines. This approach was chosen because the main problems studied are related to legal certainty, regulatory alignment, and the effectiveness of regulations regarding electric vehicles in Indonesia. The data used are sourced from primary, secondary, and tertiary legal materials.

Normative research aims to examine and understand how the law should apply (*das sollen*), not how the law is practiced in empirical reality (*das sein*), so that the entire analysis process relies on primary and secondary legal materials that are textual and conceptual.¹⁰

As explained by Peter Mahmud Marzuki, normative legal research is a method that focuses on the study of legal materials as the main object of study, by interpreting and constructing applicable laws to answer certain legal issues.¹¹ According to Marzuki, this approach is prescriptive because it aims not only to describe the law, but also to provide normative arguments for the validity of a legal action or act in the legal

⁸ Berliandaldo, M., & Prasetio, A. (2022). Analisa dan Tinjauan Hukum atas Kebijakan Pengembangan dan Pemanfaatan Kendaraan Bermotor Listrik pada Sektor Pariwisata Indonesia. *Sanskara Hukum Dan HAM*, 1(02), 01-12.

⁹ Anugrah, D. F., Rishanty, A., Rahmawati, D., & Tjahjono, B. (2025). Navigating the path to a greener future: unravelling the challenges and prospects of electric vehicle adoption in Indonesia. *Journal of Enterprise Information Management*, 38(3), 901-922.

¹⁰ Novea Elysa Wardhani, Sepriano, and Reni Sinta Yani, *Metodologi Penelitian Bidang Hukum* (Jambi: PT. Sonpedia Publishing Indonesia., 2025).

¹¹ Peter Mahmud Marzuki, *Penelitian Hukum* (Jakarta: Kencana Prenada Media Group, 2011).

system adopted.¹² Meanwhile, Soerjono Soekanto and Sri Mamudji stated that normative legal research includes research on legal principles, legal systematics, legal synchronization, legal history, and comparative law.¹³

Primary legal materials include relevant laws and regulations, especially Presidential Regulation Number 79 of 2023 concerning the Acceleration of the Development of the Battery-Based Electric Motor Vehicle Industry in Indonesia and Law Number 22 of 2009 concerning Road Traffic and Transportation. The two regulations will be reviewed to assess the extent to which the regulation is able to provide a comprehensive legal basis in accelerating the electric vehicle ecosystem, both from the perspective of industrial development and traffic safety aspects.

Secondary legal materials include academic literature, legal journals, research results, as well as the views of experts discussing electric vehicle regulation, energy transition, and consumer protection. The analysis of secondary legal materials is used to strengthen arguments in finding weaknesses, legal *gaps*, and potential disharmonization between rules. Tertiary legal materials are in the form of legal dictionaries, encyclopedias, and other supporting sources that help clarify the legal terminology used.

In the analysis, this study uses a statute approach to examine the content and hierarchy of regulations, a conceptual approach to understand the basic principles of consumer protection and environmental sustainability, and a comparative approach by looking at the practices of other countries in regulating electric vehicles. With this method, the research is expected to identify the consistency and suitability of Presidential Regulation 79 of 2023 with Law 22 of 2009, as well as find a more integrative legal policy direction.

The analysis is carried out in a descriptive-analytical manner, namely by describing the applicable legal norms, then analyzing them to find strengths, weaknesses, and needs for regulatory reform. The main focus is directed at the integration of electric vehicle industrialization policies regulated in Presidential Regulation 79 of 2023 with the technical regulation of vehicle operations in Law 22 of 2009. Thus, the results of this study are expected to provide legal recommendations that are not only normative, but also applicable in encouraging the acceleration of electric vehicles in Indonesia.

DISCUSSION

Consistency of National Policies in Accelerating Electric Vehicles through Presidential Regulation Number 79 of 2023

Presidential Regulation Number 79 of 2023 is present as a strategic legal instrument in accelerating the battery-based electric vehicle (KBLBB) ecosystem in Indonesia by affirming legal certainty, strengthening

¹² Mahlil Adriaman et al., *Pengantar Metode Penelitian Ilmu Hukum* (Padang: Yayasan Tri Edukasi Ilmiah, 2024).

¹³ Rangga Suganda, "Metode Pendekatan Yuridis Dalam Memahami Sistem Penyelesaian Sengketa Ekonomi Syariah," *Jurnal Ilmiah Ekonomi Islam* 8, no. 3 (2022): 2859, <https://doi.org/10.29040/jiei.v8i3.6485>.

the investment climate, and harmonizing cross-sector policies.¹⁴ As a revision of Presidential Regulation 55 of 2019, this regulation acts as an umbrella policy that is the main reference for ministries/institutions in formulating technical policies related to industry, fiscal, transportation, and energy. Legal certainty for the industry and investors is realized through the expansion of the scope of the KBLBB definition which now includes vehicles converted by certified workshops, clarity of the target of the Domestic Component Level (TKDN) in stages of 40% until 2026, 60% in 2027–2029, and 80% from 2030 as well as the provision of CBU/CKD import facilities with 0% import duty until the end of 2025 for producers who are committed to local investment. This mechanism not only creates a temporary market bridge, but also provides clear policy signals to battery manufacturers, component suppliers, and global automotive players who are considering investment locations. On the fiscal side, Presidential Regulation 79/2023 integrates incentives in the form of Government-Borne VAT, the amount of which is determined based on TKDN achievements, PPnBM relief, and regional tax relief such as PKB and BBNKB provided by local governments, so as to cumulatively reduce the total cost of ownership of electric vehicles for consumers.¹⁵ Furthermore, non-fiscal support is also provided through the acceleration of type tests, safety standardization, and regulatory certainty for the conversion of gasoline-based motor vehicles to electric, which simultaneously opens up space for the development of the retrofit market.

Strengthening the domestic supply chain is one of the core of this Presidential Regulation, where TKDN is used as an industrial policy instrument to encourage the localization of battery production and other key components, with a special assignment to the Ministry of Industry in developing a TKDN calculation methodology that gives significant weight to batteries as a strategic component. This policy is also associated with the investment incentive mechanism managed by the Ministry of Investment/BKPM, so that every fiscal facility provided can be linked to investment commitments and production realization. On the infrastructure side, Presidential Regulation 79/2023 synergizes the construction of Public Electric Vehicle Charging Stations (SPKLU) and Public Electric Vehicle Battery Swapping Stations (SPBKLU) through technical regulations of the Minister of Energy and Mineral Resources Regulation No. 1 of 2023 which regulates business schemes, identity numbering, and minimum location of SPKLU/SPBKLU in strategic public areas, as well as integrating it with the electricity licensing system so that PLN's power supply can be planned synchronously. This confirms a policy orientation that is not only focused on the availability of electric vehicles themselves, but also on the readiness of the overall supporting ecosystem.

However, although the design of this Presidential Regulation shows a strong consistency direction, there are a number of points prone to disharmony that need to be anticipated. For example, the relaxation of electric vehicle imports until the end of 2025 has the potential to cause import dependence if it is not firmly ended through the sunset clause, while on the other hand the TKDN target requires a consistent commitment

¹⁴ Jannah, A. Z. (2024). *Assessing The Validity of Indonesian Electric Vehicle Subsidy Rules Under The WTO Regulations* (Doctoral dissertation, Universitas Islam Indonesia).

¹⁵ Patil, G., Pode, G., Diouf, B., & Pode, R. (2024). Sustainable decarbonization of road transport: policies, current status, and challenges of electric vehicles. *Sustainability*, 16(18), 8058.

to local production.¹⁶ In the technical field, the synchronization of connector standards, battery safety, and cybersecurity still requires unification in the form of a comprehensive Indonesian National Standard (SNI) to avoid different interpretations between agencies and local governments. In addition, battery waste management has not been fully integrated into the KBLBB policy framework, even though environmental regulations have regulated the quality standards for battery emissions and recycling, so a more structured extended producer responsibility (EPR) roadmap is needed. Coordination between the central and regional governments also faces challenges, especially in the implementation of regional fiscal incentives, the determination of SPKLU locations, and spatial adjustments that have the potential to result in non-uniform practices. However, overall Presidential Decree 79/2023 can be said to have succeeded in uniting the industrial, fiscal, energy, and transportation policy paths in one comprehensive integrative framework, thereby strengthening national policy consistency in accelerating the adoption of electric vehicles, while providing a signal of certainty for industry, investors, and consumers that Indonesia is serious about building the KBLBB ecosystem in a sustainable and directed manner.

In addition to being a regulatory framework for the acceleration of electric vehicles, Presidential Decree 79 of 2023 also has a strategic dimension in encouraging the integration of national energy policies. The presence of electric vehicles is seen not only as an environmentally friendly transportation solution, but also as an instrument of energy transition towards a cleaner and more sustainable energy mix.¹⁷ This is in line with the government's target to reduce greenhouse gas emissions and achieve *net zero emissions* by 2060 or sooner.¹⁸ By expanding the electric vehicle market, the need for batteries and energy storage systems will increase, so that it can support the integration of intermittent renewable energies such as solar and wind power. This synchronization puts electric vehicle policies in a strategic position, not only for the transportation sector, but also for national energy security, resource diversification, and the creation of new industrial value chains that are able to provide a *spillover effect* on economic growth and green job creation.¹⁹

Furthermore, Presidential Decree 79 of 2023 also strengthens the aspect of policy governance through a cross-ministry and institutional coordination mechanism. This is important considering that electric vehicle policies intersect with various sectors ranging from industry, energy, environment, to finance and local government. The presence of the coordination team updated in this Presidential Regulation is an institutional instrument to ensure consistency of implementation, synchronization of derivative rules, and evaluation of measurable target achievements. With the existence of a periodic evaluation mechanism, the

¹⁶ Marwing, S., Hermana, J., Syafe'i, A. D., & Assomadi, A. F. (2025). STRATEGI PENGEMBANGAN INFRASTRUKTUR KENDARAAN LISTRIK UNTUK MENDUKUNG TRANSISI ENERGI BERSIH DI KOTA BAUBAU. *Inovasi Pembangunan: Jurnal Kelitbangan*, 13(2).

¹⁷ Rizky, L., Pratiwi, T. S., Wibawa, A., & Achdiyana, I. (2023). Peran Negara G20 dalam Percepatan Transisi Energi Baru Terbarukan (EBT) untuk Mewujudkan Ketahanan Energi Nasional. *Jurnal Ketahanan Nasional*, 29(3).

¹⁸ Anugraheni, B. D. (2024, January). Akselerasi Net Zero Emissions Dengan Implementasi Energi Baru Terbarukan (EBT) Sebagai Bentuk Upaya Sustainable Development Goals (SDGs). In *Prosiding Seminar Nasional Hukum, Bisnis, Sains Dan Teknologi* (Vol. 4, No. 1).

¹⁹ Sinurat, L. A. E. S. (2024). *Implementasi Carbon Capture Storage (CCS)/Carbon Capture Utilization Storage (CCUS) Oleh Indonesia Di Industri Migas Dalam Mencapai Net Zero Emission 2060* (Doctoral dissertation).

government can adjust policy directions based on market dynamics, technological developments, and public responses to the adoption of electric vehicles. In the end, strong governance and solid coordination will determine the extent to which this Presidential Regulation can truly become a consistent instrument that is able to integrate national policies comprehensively, while overcoming the potential for disharmonization of sectoral regulations that have been the main obstacle in the development of the electric vehicle ecosystem in Indonesia.

Relevance and Limitations of Law Number 22 of 2009 in Accommodating Electric Vehicles

Law Number 22 of 2009 concerning Road Traffic and Transportation (UU LLAJ) is basically the main legal umbrella that regulates the implementation of traffic and the use of motor vehicles on the road, so that it remains relevant for the existence of electric vehicles. The norms stipulated in it regarding the obligation of registration, identification, type tests, safety standards, and operational requirements for motor vehicles in general can also be applied to electric vehicles, because the basic principle of this Law is to ensure traffic safety and order. For example, the provisions regarding vehicle type tests as stipulated in Articles 50–53 of the LLAJ Law can be applied to electric vehicles, although the test parameters need to be expanded to take into account typical components such as batteries, electric motors, and energy management systems. Similarly, the obligation to register vehicles, issuance of STNK and BPKB, and provisions regarding driving safety are still relevant to be applied as a legality instrument that binds electric vehicles to be equivalent to conventional motor vehicles in traffic.²⁰

However, behind this relevance, the LLAJ Law has significant limitations because at the time of its drafting, the orientation of this regulation was still very focused on internal combustion engine (ICE)-based motor vehicles that use fossil fuels. This is reflected in a number of technical provisions that emphasize the aspects of exhaust gas emissions and fuel efficiency, even though these two issues are no longer relevant for electric vehicles that do not produce direct emissions at all. Another limitation lies in the absence of rules regarding typical risks of electric vehicles, such as the potential for fire due to battery failure (thermal runaway), the risk of electric shock from high-voltage systems, and the need to provide accident handling procedures that are different from conventional vehicles. In addition, the LLAJ Law does not regulate the connection of electric vehicles with supporting infrastructure such as charging stations, charging socket standards, and legal liability in the event of an accident involving an electrical system outside the vehicle. The classification of vehicles regulated in this law also still tends to generalize motor vehicles without distinguishing between the categories of pure electric, hybrid, and fuel cell vehicles, thus causing ambiguity in the application of norms.

These limitations show that there is a regulatory gap that needs to be overcome immediately so that legal certainty on the use of electric vehicles can be guaranteed. This regulatory gap can cause serious problems, both in terms of safety and in supporting the energy transition acceleration policy that has been outlined by the government. Therefore, it is necessary to take steps to update the law through the revision or amendment

²⁰ Irawan, F. (2021). *Tinjauan Terhadap Eksistensi Ojek Online Menurut Peraturan Menteri Nomor Pm 108 Tahun 2017 Tentang Penyelenggaraan Angkutan Orang Dengan Kendaraan Bermotor Umum Tidak Dalam Trayek* (Doctoral dissertation, Universitas Islam Riau).

of the LLAJ Law to explicitly include the category of electric vehicles along with technical standards, operational requirements, and safety rules that are in accordance with their characteristics. In addition to updating the law, synchronization with other regulations is also important, especially with Presidential Regulation Number 79 of 2023 concerning the Acceleration of Battery-Based Electric Motor Vehicles which has provided national policy direction, as well as technical regulations from the Ministry of Transportation related to electric vehicle type tests and safety standards. In addition, consumer and environmental protection aspects also need to be integrated, for example through the obligation of manufacturers to recall if product defects are found in the battery system, public charging safety standards, to regulations regarding the recycling or disposal of used batteries. Thus, although the LLAJ Law still has relevance as a basic legal framework, its limitations in accommodating the unique characteristics of electric vehicles affirm the urgency of legal reform and cross-regulatory harmonization so that the national traffic system is able to adapt to the development of sustainable transportation technology.

In addition, the relevance and limitations of the LLAJ Law in accommodating electric vehicles must also be placed in the context of energy transition and sustainable development in Indonesia. The presence of electric vehicles does not only present technical traffic issues, but also related to the national agenda of reducing carbon emissions, energy efficiency, and improving environmental quality. Therefore, transportation regulations must not stand alone, but must synergize with energy, environmental, and national automotive industry policies. In this case, the LLAJ Law should ideally be revised to not only regulate aspects of traffic safety and order, but also support the sustainability of the electric vehicle ecosystem as a whole, including the provision of green infrastructure, integration with electric-based public transportation systems, and the provision of legal incentives for people who switch to environmentally friendly vehicles.

Furthermore, strengthening electric vehicle regulations through the LLAJ Law is also important to provide legal certainty for various parties involved, ranging from manufacturers, consumers, to infrastructure providers. Without clear legal norms, the potential for disputes and consumer losses can increase, for example related to legal liability for battery damage, accidents triggered by electrical system disruptions, or negligence in battery waste management. Thus, the renewal of the LLAJ Law is not solely a technical need, but also a strategic need in creating adaptive, responsive, and forward-looking transportation regulations. The presence of more comprehensive regulations will ensure that electric vehicles can develop within a legal framework that is fair, safe, and supports Indonesia's ideals towards sustainable transportation and the achievement of Net Zero Emission targets.

Harmonization of Regulations and Directions of National Legal Policies in the Development of Electric Vehicles in Indonesia

The harmonization of regulations in the development of electric vehicles in Indonesia is an urgent need so that the acceleration of industrialization can go hand in hand with legal certainty on the highway and do not cause overlap or regulatory vacancies. On the one hand, Presidential Regulation Number 79 of 2023 is present as a strategic policy instrument that expands the Battery-Based Electric Motor Vehicle (KBLBB) ecosystem through regulations regarding fiscal and non-fiscal incentives, affirmation of space for converting conventional motor vehicles to electric, providing opportunities for CBU imports under certain

conditions, and setting the Domestic Component Level (TKDN) target as a driver of domestic industrialization. However, on the other hand, this acceleration policy must remain in line with Law Number 22 of 2009 concerning Road Traffic and Transportation (LLAJ) which functions as the main legal framework in ensuring safety, order, and legal certainty on the highway through regulations regarding type tests, technical requirements and roadworthiness, as well as registration and identification of motor vehicles. The connection between these two regulations is very important, for example in the aspect of homologation of new electric vehicles, conversion vehicles, and imported vehicles, all of which must be subject to type tests and periodic tests as stipulated in the provisions of the LLAJ and its derivative regulations, so that incentives can only be given after the vehicle passes safety standards.²¹

In addition, harmonization is also needed in the arrangement of supporting infrastructure such as Public Electric Vehicle Charging Stations (SPKLU) and Public Electric Vehicle Battery Exchange Stations (SPBKLU) which according to Presidential Decree 79/2023 and the Minister of Energy and Mineral Resources Number 1 of 2023 are regulated in terms of tariffs, locations, and identification codes, but must still pay attention to traffic safety aspects as mandated by LLAJ. If coordination between ministries and institutions is not carried out, there is a potential for overlapping authority, for example between Energy and Mineral Resources as the energy regulator and the Ministry of Transportation as the traffic authority. At this point, there are also empty areas that need to be strengthened, such as standardization of interoperability of inter-brand swap batteries, waste management of used batteries based on the principle of extended producer responsibility (EPR), and emergency procedures in handling fires due to battery failures that have not been comprehensively regulated until now. Another gap that needs to be anticipated is the aspect of cybersecurity and consumer data protection in modern digitally connected electric vehicles, so that legal updates must be able to accommodate these technological developments without sacrificing consumer safety and rights.²²

The urgency of regulatory harmonization is also closely related to consumer protection, which includes transparency of information regarding vehicle specifications, battery warranty guarantees for a certain period of time, certainty of the availability of spare parts, and clarity of electricity charging rates that must be displayed transparently on SPKLU and digital applications. In this way, consumers are not only protected from harmful practices, but also gain legal certainty when deciding to switch to electric vehicles. Furthermore, the direction of national legal policy in the development of electric vehicles should no longer be sectoral, but integrative across ministries oriented towards achieving the big goals of the energy transition and net zero emission targets. This means that the policies designed must be adaptive, outcome-based, and able to measure success through traffic safety indicators, consumer protection, carbon emission reduction, and compliance-based incentive governance. Thus, the harmonization of Presidential Decree 79/2023 and Law 22/2009 is not just a matter of synchronizing legal texts, but further a strategic step to

²¹ Putri, I. R. (2025). Ketidakpastian Hukum dan Investasi dalam Hilirisasi: Studi Komparatif Indonesia dan China dalam Pengembangan Energi Terbarukan. *Jurnal Rechts Vinding: Media Pembinaan Hukum Nasional*, 14(1).

²² Nur, A. I., & Kurniawan, A. D. (2021). Proyeksi masa depan kendaraan listrik di Indonesia: analisis perspektif regulasi dan pengendalian dampak perubahan iklim yang berkelanjutan. *Jurnal Hukum Lingkungan Indonesia*, 7(2), 197-220.

ensure that the acceleration of electric vehicles can run in the corridors of legal certainty, community protection, and environmental sustainability that support the national energy transformation towards a net zero emission Indonesia in 2060 or sooner.

In addition to emphasizing normative integration between Presidential Regulation Number 79 of 2023 and Law Number 22 of 2009, the direction of national legal policy in the development of electric vehicles also needs to pay attention to the dimension of decentralization and the principle of regional autonomy. The authority of local governments to provide non-fiscal incentives, such as parking levy relief, special lane access, and the provision of charging facilities in public spaces, is a manifestation of the principle of decentralization as regulated in the legal framework of local government. However, the absence of uniform technical guidelines has the potential to cause disparities between regions, thus implicating legal uncertainty and hindering efforts to nationalize the electric vehicle ecosystem. Therefore, regulatory intervention from the central government is needed in the form of a model regional regulation or minimum service standards that are aligned with traffic safety norms and traffic engineering principles as stipulated in the LLAJ Law. Thus, the incentives provided by local governments not only serve as a stimulus for the adoption of electric vehicles, but are also integrated in sustainable transportation governance that is consistent across jurisdictions.

Furthermore, legal reform that is responsive to technological developments is a *sine qua non* conditio for the sustainability of the national legal system in the electric vehicle sector. Disruptive technological changes require legal arrangements that include new aspects, such as software security, system update mechanisms through over-the-air updates, protection of consumer data stored in vehicle telemetry systems, and standardization of the latest generation of battery safety. This complexity requires a more comprehensive legal umbrella, both through amendments to Law 22/2009 to include terminology and technical norms for electric vehicles, or through the establishment of cross-sector implementing regulations that function as a bridge between Presidential Decree 79/2023 and regulations in the fields of energy, environment, and consumer protection.²³ Dengan adanya pembaruan hukum yang bersifat adaptif dan integratif, maka transisi menuju era kendaraan listrik tidak dapat dipahami semata-mata sebagai pergeseran teknologi, melainkan sebagai transformasi normatif dan kelembagaan yang menjamin keselamatan pengguna jalan, perlindungan hak-hak konsumen, serta keberlanjutan lingkungan hidup sesuai dengan arah kebijakan energi nasional dan target net zero emission..

CONCLUSIONS

Presidential Regulation Number 79 of 2023 is present as a strategic legal instrument that strengthens the battery-based electric vehicle ecosystem in Indonesia by providing legal certainty, expanding investment space, and unifying cross-sector policies. This regulation not only regulates fiscal and non-fiscal incentives, but also affirms the importance of the Domestic Component Level (TKDN) as an instrument of industrialization and localization of production. On the other hand, Law Number 22 of 2009 concerning Road Traffic and Transportation remains relevant as the main legal umbrella that regulates the safety, registration, and technical requirements of motor vehicles, although it still has limitations because it is

²³ Judijanto, L. (2025). Komitmen Indonesia Dalam Ratifikasi Paris Agreement: Analisis Yuridis Dan Implementasi Kebijakan Penurunan Emisi Karbon. *JOURNAL OF LAW AND NATION*, 4(1), 167-176.

oriented towards internal combustion engine-based vehicles. Disharmonization has the potential to arise if import relaxation is not strictly terminated or technical standards have not been unified in the form of a comprehensive SNI. Therefore, the harmonization of regulations between Presidential Regulation 79/2023 and the LLAJ Law is an urgent need so that the acceleration of electric vehicles does not cause overlap or legal vacuums. This integration must also include aspects of consumer protection, from the transparency of charging rates to the guarantee of battery and spare parts safety. The role of local governments in providing non-fiscal incentives needs to be aligned with national norms so as not to cause policy disparities. Adaptive legal reform is a sine qua non conditio to anticipate the development of electric vehicle technology that is fraught with issues of digital security, battery safety, and data protection. With coordinated governance and continuous evaluation, the electric vehicle ecosystem can grow consistently, safely, and inclusively. In the end, the harmonization of these regulations is not just about synchronizing norms, but also about the transformation of national energy towards sustainable transportation. With this step, Indonesia will not only accelerate the adoption of electric vehicles, but also strengthen energy security, encourage green economic growth, and realize the net zero emission target of 2060 or sooner.

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