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RECONSTRUCTING LEGAL REGULATION OF BATTERY ELECTRIC VEHICLES FOR SUSTAINABLE DEVELOPMENT IN INDONESIA

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Abstract:
This article examines legal certainty challenges in Indonesia's battery electric vehicle regulation and proposes a reconstruction to align governance with sustainable development better. The study uses normative legal Research employing statutory and conceptual approaches, focusing on the existing regulatory framework and relevant legal principles. The analysis finds that current regulation still contains vague norms and regulatory gaps, particularly regarding enforceable obligations for business actors, producer responsibility across the battery life cycle, battery waste governance, oversight mechanisms, inter-institutional coordination, and the effectiveness of sanctions. These weaknesses may reduce legal certainty, undermine accountability, and lead to inconsistent implementation across sectors and levels of government. The study interprets these findings as indicating the need to strengthen the regulatory design by introducing clearer, binding norms that integrate environmental accountability and fair transition considerations, supported by measurable compliance duties and effective enforcement mechanisms. The article concludes that legal reconstruction is essential to ensure a consistent, accountable, and sustainable pathway for Indonesia's national battery-electric vehicle ecosystem.

INTRODUCTION

Indonesia's battery electric vehicle (BEV) program is increasingly positioned as a strategic instrument to support cleaner mobility, industrial transformation, and sustainability-oriented development. In practice, the policy is not merely technological; it is a governance issue that requires clear regulatory design, reliable compliance mechanisms, and accountable public administration (Dwiananto *et al.*, 2022). From the perspectives of governance, taxation, and auditing, BEV acceleration relies on public incentives, procurement decisions, and inter-agency coordination that must be transparent, measurable, and legally enforceable to avoid inefficiency, regulatory capture, and inconsistent implementation (Negara, 2024; Habiburrahman *et al.*, 2025). Recent state-of-the-art studies generally emphasize that successful BEV transitions depend on coherent regulation, fiscal instruments, and strong oversight across the battery life cycle, including waste management and producer accountability. However, a persistent gap remains in how Indonesia's current regulatory framework provides legal certainty and enforceable duties for key actors, particularly regarding producer responsibility, battery waste governance, supervision, and sanctioning. This gap is critical because unclear norms can weaken compliance, complicate auditing of policy outcomes, and reduce the credibility of incentive-based programs in achieving sustainability targets (Sasongko *et al.*, 2024).

The BEV policy also carries direct implications for taxation and fiscal governance. Incentive schemes—such as tax exemptions, subsidies, and preferential procurement—require a clear legal basis, eligibility criteria, and measurable performance indicators to ensure that public resources are

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allocated fairly and effectively (Rajagopal, 2023). Without precise regulatory standards, fiscal incentives risk inconsistent implementation, creating unequal treatment among market actors and increasing the likelihood of compliance disputes (Purnamasari *et al.*, 2022; Damanik, Octavia, and Hakam, 2024). Moreover, unclear incentive design complicates the evaluation of policy effectiveness because the expected outputs and outcomes cannot be audited against an explicit legal benchmark. In addition, BEV ecosystem development involves multiple public and private stakeholders whose roles must be governed through a coherent accountability framework. Government agencies coordinate industrial policy, infrastructure deployment, and environmental safeguards, while producers and service providers carry operational responsibilities that may extend beyond production into after-use management. Weakly defined obligations and fragmented coordination can create governance risks, including overlap of authority, regulatory gaps, and limited traceability of responsibilities. These conditions may hinder auditability of program implementation and reduce public trust in the transition process (Mersky *et al.*, 2016; Narassimhan and Johnson, 2018).

Another critical governance dimension concerns risk management and control mechanisms in the BEV battery life cycle. The environmental and safety risks associated with batteries—especially at end-of-life—require enforceable compliance obligations and systematic monitoring. If regulatory norms do not clearly specify obligations for take-back systems, tracking, recycling standards, and reporting, enforcement becomes discretionary and uneven. It weakens legal certainty for regulated entities and undermines the credibility of sustainability claims made by policymakers and market participants. Finally, the effectiveness of BEV regulation depends on the presence of enforcement instruments that translate policy goals into real compliance behavior. In regulatory practice, sanctions are not merely punitive; they function as corrective tools to ensure adherence to standards and protect the public interest. When sanctioning provisions are absent, unclear, or difficult to apply, the regulatory framework may become overly aspirational and fail to deter. Therefore, strengthening legal certainty through clearer norms, enforceable obligations, and auditable governance mechanisms is essential not only to support BEV acceleration but also to ensure that the transition delivers accountable, sustainable, and equitable outcomes in Indonesia (Stekelberg and Vance, 2024).

Accordingly, this article addresses the following Research problem: to what extent does Indonesia's BEV regulation provide legal certainty and governance accountability to support sustainable implementation? The study is guided by two Research questions: (1) What are the key normative weaknesses and governance risks within the existing BEV regulatory framework, and (2) what regulatory reconstruction is needed to strengthen enforceable obligations, oversight, and accountability in line with sustainable development principles?

This article offers novelty by connecting BEV regulation to governance and auditability requirements, focusing on regulatory clarity, enforceability, and accountability mechanisms rather than solely on policy ambition. By proposing a reconstruction agenda grounded in legal certainty and sustainability governance, the study contributes to improving regulatory quality and strengthening public accountability in Indonesia's BEV transition (Fridstrøm and Østli, 2017; Sun *et al.*, 2022; Noll, Schmidt, and Egli, 2024).

METHODS

This study employs normative legal Research using statutory and conceptual approaches. The statutory approach examines Indonesia's legal framework governing battery electric vehicles, focusing on Presidential Regulation No. 55 of 2019, as amended by Presidential Regulation No. 79 of 2023, and other related regulations governing governance, taxation, and environmental

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accountability (Rezvani *et al.*, 2025). The "sample" in this study consists of selected legal materials (primary sources such as statutes and regulations, and secondary sources such as scholarly journal articles and authoritative legal commentaries) directly related to BEV governance and enforcement. The place of Research is library-based Research in Indonesia, conducted through systematic document collection from official legal databases and academic repositories. Data were analyzed using qualitative legal analysis, content analysis, and prescriptive (normative) evaluation to identify regulatory gaps, assess legal certainty and accountability, and formulate recommendations for regulatory reconstruction aligned with sustainable development principles.

RESULT AND DISCUSSION

The study's findings indicate that Indonesia's battery electric vehicle (BEV) regulatory framework is designed to accelerate adoption through policy direction, institutional coordination, and incentive facilitation. Within the regulatory structure, the framework prioritizes industrial development, infrastructure readiness, and mechanisms for program implementation. However, when assessed through the lenses of legal certainty and governance accountability, several provisions remain general and leave substantial discretion to implementing agencies. It creates variability in interpretation and weakens the predictability of compliance expectations for regulated actors (Wiratmoko *et al.*, 2023).

The first major finding concerns normative clarity. Several regulatory formulations are drafted in broad policy language rather than operational legal norms, so the boundary between "policy objectives" and "binding obligations" is not always clear. This condition affects governance performance because obligations cannot be uniformly translated into measurable compliance indicators. Prior studies on regulatory quality in emerging technology governance similarly emphasize that vague norms often lead to fragmented implementation and uneven enforcement across institutions, reducing accountability outcomes. The second finding relates to fiscal governance and incentive administration. BEV policy implementation depends on incentives typically delivered through taxation-related instruments and government support schemes, which require clear eligibility criteria, transparency standards, and consistent auditing trails. The study finds that incentive design tends to emphasize acceleration targets while leaving gaps in transparency of criteria and performance evaluation standards. In the governance and auditing context, such gaps can complicate verification of whether incentives achieve intended outcomes or merely increase administrative spending without proportional sustainability benefits.

The third finding concerns institutional coordination. BEV governance involves multiple agencies across industrial policy, transportation, energy, and environmental management, and the regulatory framework envisions coordination but does not always specify decision-making hierarchies, accountability lines, or conflict-resolution procedures. As a result, overlapping authority may occur in implementation stages such as infrastructure planning, compliance monitoring, and reporting. This finding aligns with recent governance literature, which shows that multi-agency programs require explicit coordination protocols to prevent "responsibility diffusion" and ensure auditable program outputs. The fourth finding focuses on producer responsibility and life-cycle accountability. The study identifies regulatory insufficiency in translating producer accountability into enforceable obligations covering the battery's life cycle, including post-consumption phases. While sustainability principles suggest responsibility should extend beyond production to end-of-life management, existing norms do not consistently impose measurable duties for take-back systems, tracking, and reporting. Prior Research on extended producer responsibility in battery

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governance highlights that without enforceable take-back and recycling duties, the regulatory system may shift environmental risks downstream to local governments and communities.

The fifth finding relates to battery waste governance and environmental control mechanisms. The analysis shows that end-of-life battery management requires a stronger linkage between BEV acceleration policy and ecological protection governance, including clear standards for collection, storage, transport, and oversight of recycling. Where norms are insufficiently operational, enforcement becomes discretionary and dependent on administrative capacity rather than legal command. Comparative studies in battery waste regulation commonly indicate that effective environmental governance requires traceability systems and compliance reporting frameworks, enabling regulators and auditors to verify whether waste is managed in line with sustainability objectives. The sixth finding addresses regulatory enforcement and sanctioning. The study finds that enforcement mechanisms are not always framed with adequate deterrence and corrective power, particularly when obligations are vague or when sanctions are not clearly connected to specific violations. From a governance perspective, sanctions serve to ensure compliance and protect the public interest, not merely as punishment. This finding aligns with regulatory enforcement scholarship, which emphasizes that weak sanctioning design can render regulations aspirational, reducing compliance incentives and weakening the credibility of state oversight.

The seventh finding concerns the role of local government and the consistency of implementation. BEV ecosystem implementation inevitably interacts with local-level governance through licensing, infrastructure placement, environmental oversight, and community risk management. The study finds that local government roles are not always framed with sufficient authority and resources to ensure consistent implementation, potentially leading to uneven policy outcomes across regions. Prior Research on decentralization and policy delivery stresses that central programs require clear local mandates and measurable coordination arrangements to avoid implementation gaps and to improve auditability of local outcomes.

Overall, the results indicate that the key governance risks in BEV regulation arise from the combination of vague norms, fragmented institutional accountability, insufficient life-cycle responsibility, and limited enforceability. Interpreting these findings through the lens of legal certainty and sustainable development principles, the study concludes that regulatory reconstruction is necessary to introduce clearer, binding obligations, measurable compliance standards, a stronger oversight architecture, and effective sanctions. The reconstruction direction should also strengthen fiscal accountability of incentives and formalize central–local coordination to ensure that BEV transition outcomes can be transparently monitored and credibly audited (Dwiananto *et al.*, 2022). In doing so, Indonesia's BEV governance can better support sustainable development while safeguarding public accountability and consistent legal implementation. The results of the study are presented directly from the results of data processing and data in the field that have been carried out, by including previous Research so that Research relationships can be known (Fathoni, Lovett, and Rifansha, 2025). The scientific findings in question are Research data obtained during conducting Research activities for the public. The results and discussion are based on the analysis and interpretation of theory and Research results, including data processing results.

CONCLUSION

This study concludes that Indonesia's battery electric vehicle (BEV) regulatory framework has not yet provided sufficient legal certainty and governance accountability to support sustainable implementation. The analysis confirms that the main scientific findings are concentrated in several core areas: the persistence of vague norms that weaken enforceable compliance standards; gaps in

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fiscal and incentive accountability that reduce auditability; fragmented institutional coordination that blurs responsibility lines; and insufficient life-cycle governance for batteries that limits environmental accountability. These conditions collectively indicate that the existing regulatory design is still more policy-oriented than obligation-oriented, which may lead to inconsistent implementation and weaker public oversight. Based on the Research objectives, the study affirms the need for regulatory reconstruction to strengthen binding norms, measurable obligations, clearer oversight architecture, and effective sanctions, while reinforcing accountability for incentives and clarifying the role of local governments to ensure consistent implementation across regions. Future Research may expand this study by examining implementation practices through empirical fieldwork, assessing the effectiveness of incentive-auditing mechanisms, and comparing battery life-cycle governance models across countries to identify best practices adaptable to Indonesia's legal and institutional context.

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