Asia Africa Regulatory Development Review
Vol. 1, No. 2, pp. 181-198
E-ISSN: 3106-8707
P-ISSN: 3106-8693
Journal homepage: https://aardr.co.mg/index.php/journal/index

Research Paper

Policy to Market Take-Off: A Strategic Entry Roadmap for Indonesia's Electric Vehicle Industry

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Abstract

Indonesia's electric vehicle (EV) ecosystem has moved rapidly from policy intent to early market take-off, driven by regulations, fiscal incentives, and investment in charging infrastructure and battery value chains. Yet adoption remains shaped by acute price sensitivity, uneven charging coverage, and progressively stricter local-content (TKDN) rules. This article develops a strategic market-entry roadmap for PT ISVO, a hypothetical start-up targeting Indonesia's four-wheeler battery EV segment. Using a qualitative synthesis of Indonesia's regulatory instruments, policy and market reports, and Indonesia-focused scholarship on consumer behaviour, adoption barriers, and nickel-based industrial policy, the analysis connects the incentive and governance architecture to demand conditions and operational constraints. The paper's central contribution is to translate this regulatory–market evidence into a staged entry logic that specifies how a new entrant can sequence geographic rollout, pricing, localisation, and ESG risk management, thereby moving beyond studies that examine policy, adoption, or industrial strategy in isolation. The article concludes that Indonesia's regulatory development has materially reduced entry uncertainty for capable new players, but that commercial viability depends on disciplined execution across affordability, charging access, after-sales service, localisation, and nickel governance. The lessons are relevant not only for Indonesia, but also for resource-rich Asia–Africa economies designing EV industrial strategies.

Keywords: Electric Vehicles, Market Entry, Local Content (TKDN), Charging Infrastructure, Consumer Preferences, Nickel

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Published by ASTA Research Center

How to cite
Ahmed, Issa G. and Vololoniaina Sarah Laurence. "Policy to Market Take-Off: A Strategic Entry Roadmap for Indonesia's Electric Vehicle Industry." *Asia Africa Regulatory Development Review* 1, no. 2 (2025): 181-198.

1. Introduction

Policy clarity has been followed by rapid, but uneven, market expansion. Battery-electric passenger-car registrations reportedly increased from 125 units in 2020 to more than 40,000 units by 2024, lifting EVs to around five percent of annual new car sales.[1] Market projections also suggest strong growth in the value of the EV sector through 2030.[2] However, adoption remains concentrated in metropolitan Java–Bali and is constrained by range and infrastructure anxiety, battery-life and resale-value concerns, and persistent affordability barriers.[3] On the supply side, new entrants face archipelagic logistics, tightening TKDN requirements, and rising scrutiny of nickel-intensive supply chains, even as the same policy package has attracted substantial foreign investment by firms such as BYD, Hyundai–Kia, LG Energy Solution, and VinFast.[4]

Existing studies on Indonesia's EV transition typically examine consumer adoption drivers, infrastructure readiness, or the industrial and environmental implications of nickel down streaming. Less developed, however, is an integrative, firm-level roadmap that translates these strands into strategic sequencing decisions for a new market entrant operating under TKDN-linked incentives and spatially uneven infrastructure. This article addresses that gap by developing a regulation-to-market entry roadmap for PT ISVO as an analytical case, specifying the strategic logic through which an entrant can align product positioning, rollout choices, localisation, partnerships, and ESG governance with Indonesia's evolving EV regime. It specifically addresses Indonesia, yet the analytical frame addresses a broader Asia-Africa readership, in which resource-intense economies are also employing regulation to guide the development of EV value-chains.[5]

The remainder of the paper outlines the research approach, analyses the regulatory regime and incentive structure, examines market and infrastructure development, synthesises consumer evidence, diagnoses operational constraints through a problem-tree, and derives a staged market-entry strategy with broader policy implications.

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1 Indonesia Battery Corporation, *Indonesia Electric Vehicle Industry Overview* (2025), https://www.indonesiabatterycorp.com/en/about-us; P3DI DPR RI, *Perkembangan Populasi Kendaraan Listrik di Indonesia 2020–2024* (2025).

2 International Institute for Trade and Development (ITD), *Indonesia's Electric Vehicle Industry: Opportunities and Challenges* (2024), https://www.itd.or.th/wp-content/uploads/2024/02/Indonesia-EV-industry-opportunities-and-challenges.pdf; Maximize Market Research, *Indonesia Electric Vehicle Market: Industry Analysis and Forecast to 2030* (2023).

3 Rifelly Dewi Astuti and Agung Arry Susanto, "Challenges of Electric Vehicle Adoption in Indonesia: Revealing the Hidden Factors Affecting Purchase Intention," *Jurnal Siasat Bisnis*, July 31, 2024, 149–71, https://doi.org/10.20885/jsb.vol28.iss2.art2; Natalina Damanik et al., "A Comprehensive Analysis of the Economic Implications, Challenges, and Opportunities of Electric Vehicle Adoption in Indonesia," *Energies* 18, no. 6 (March 11, 2025): 1384, https://doi.org/10.3390/en18061384. *See also* PwC Indonesia, *Indonesia's Electric Vehicle Readiness and Consumer Insights 2024* (2024), https://www.pwc.com/id/en/pwc-publications/industries-publications/consumer-and-industrial-products-and-services/indonesia-electric-vehicle-survey-2024.html

4 *Financial Times*, "Western Miner Eramet Sees No Profits in Nickel Processing without Chinese Partners," 2024, https://www.ft.com/content/e42d5e3e-30ff-4698-8348-d0e6731f2271; *Reuters*, "China's BYD to Complete $1 Billion Indonesia Plant by Year-End, Executive Says," 2025, https://www.reuters.com/business/autos-transportation/chinas-byd-complete-1-billion-indonesia-plant-by-end-2025-executive-says-2025-01-2

5 Ashurzoda Shahboz and Raldi Hendrotoro Seputro Koestoer, "The Electric Vehicle Transition in Russia and Indonesia," *Applied Environmental Science* 1, no. 1 (July 31, 2023): 33–45, https://doi.org/10.61511/aes.v1i1.2023.153; Ibham Veza et al., "Electric Vehicles in Malaysia and Indonesia: Opportunities and Challenges," *Energies* 15, no. 7 (April 1, 2022): 2564, https://doi.org/10.3390/en15072564.

This study employs a qualitative document-analysis and synthesis design to develop an evidence-based market-entry roadmap for Indonesia's four-wheeler battery EV segment. The unit of analysis is the market-entry environment faced by a prospective new entrant, operationalised through an analytical case (PT ISVO) to translate system-level conditions into firm-level strategic choices.[6]

The analysis triangulates three structured streams of evidence: (i) regulatory and policy documents that define incentives and constraints (Perpres 55/2019 and 79/2023; Ministry of Finance decrees on VAT/PPnBM relief; Ministry of Industry regulations on TKDN; and charging-infrastructure guidelines); (ii) market and infrastructure reports that document sales dynamics, investment commitments, and charging-network deployment (including utility releases from PT PLN, parliamentary briefs, and major industry and think-tank reports); and (iii) peer-reviewed scholarship on adoption behaviour, EV ecosystem development, and the political economy and environmental implications of nickel-based down streaming.

Documents were selected based on three criteria: authority (official regulations or widely cited institutional reports), topical relevance to four-wheeler BEV market entry, and temporal relevance to the current regulatory regime (primarily 2019–2025).

The synthesis proceeds in four linked stages. First, regulatory instruments are coded by policy function demand incentives, localisation requirements, and infrastructure governance to reconstruct the operative entry conditions. Second, demand-side evidence is consolidated to identify consumer segments, price bands, and adoption barriers that condition feasible positioning. Third, the findings are organised into a mutually exclusive, collectively exhaustive (MECE) problem-tree that traces structural drivers (e.g., infrastructure geography, archipelagic logistics, TKDN compliance, and nickel-linked ESG exposure) to operational bottlenecks and commercial consequences. Fourth, the problem-tree is translated into a staged strategic roadmap that specifies sequencing, partnerships, pricing and product architecture, localisation milestones, and risk-management priorities for PT ISVO. Throughout, triangulation is used to reconcile differences across sources by privileging the most authoritative and context-specific evidence, while noting where uncertainty remains.

2. Result

2.1. Evolution of Indonesia's EV Regulatory regime

2.1.1. Strategic Presidential Regulations

Perpres 55/2019 frames the acceleration of battery EV adoption as a joint energy-security, decarbonisation, and industrial-development agenda. Rather than treating EV promotion as a narrow transport intervention, the regulation couples demand stimulation with supply capability building: it enables measures to accelerate EV use, establishes coordination mechanisms to expand domestic manufacturing capacity, and mandates the development of charging and battery-swapping networks, while also signalling public-sector leadership through fleet prioritisation.[7] Perpres 79/2023 substantively deepens this framework

[6] Hani Morgan, "Conducting a Qualitative Document Analysis," *The Qualitative Report* 27, no. 1 (2022): 64–77, https://doi.org/10.46743/2160-3715/2022.5044.

[7] Salwa Putri Hardiyan, Kadek Cahya Susila Wibawa, and Muhamad Azhar, "Evaluating The Environmental Impacts of Indonesia's Electric Vehicle Policy: Aligning with Sustainability and Conservation Principles," *Masalah-Masalah Hukum* 54, no. 1 (March 27, 2025): 57–68, https://doi.org/10.14710/mmh.54.1.2025.57-68; Bin Yusuf, Armand Omar Moeis, and Andri D. Setiawan, "Understanding Electric Vehicle Acceptance in

by expanding eligible vehicle categories and clarifying the division of responsibilities across central and regional authorities, while explicitly aligning EV policy with down streaming objectives in nickel and other minerals.[8] For market entrants, this update increases policy predictability and reinforces that localisation and infrastructure alignment are not optional complements to market entry, but core conditions of competitiveness.

2.1.2. Fiscal Incentives and Local-content Requirements

Presidential guidance is operationalised through Ministry of Finance (MoF) tax instruments that directly shape retail pricing and, indirectly, localisation strategies. Recent MoF decrees provide value-added tax borne by the government (PPN DTP) for qualifying battery EVs, reducing the effective VAT rate from 11% to as low as 1% for models that meet specified TKDN thresholds.[9] In parallel, temporary relief from the luxury-goods sales tax (PPnBM) further compresses the purchase-price gap between battery EVs and internal-combustion alternatives. Crucially, these fiscal benefits are conditional: without compliance with TKDN-linked eligibility criteria, entrants face materially higher consumer prices and therefore weaker demand in a market characterised by sharp price sensitivity.

Local-content policy is specified through Ministry of Industry (MoI) regulations that define TKDN calculation methodologies for EVs and batteries, including component-level weightings (e.g., for battery packs, power electronics, and key sub-systems) and periodic revisions as domestic capability develops. The policy trajectory is therefore best understood as a staged localisation pathway rather than a static percentage target: near-term entry can be supported by assembly and selective localisation to meet the prevailing thresholds, but medium-term competitiveness depends on an explicit plan to raise TKDN in line with the tightening schedule embedded in MoI regulations and related implementing guidance.[10] For an entrant such as PT ISVO, this means that fiscal incentives and industrial policy operate as a single package, requiring early design-for-localisation decisions, supplier development, and sequencing of investments to maintain eligibility and sustain competitive pricing.[11]

2.1.3. Governance of Charging Infrastructure

Charging infrastructure development is governed through an electricity-sector framework in which the state-owned utility PT PLN plays a central coordinating role. PLN functions not only as a network operator, but also as an integrator of business models, tariff

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Indonesia Using Structural Equation Modeling: A Conceptual Model," in *4th Asia Pacific Conference on Research in Industrial and Systems Engineering 2021* (New York, NY, USA: ACM, 2021), 540–45, https://doi.org/10.1145/3468013.3468655. *See also* j Republic of Indonesia, Presidential Regulation No. 55 of 2019 concerning the Acceleration of the Battery Electric Vehicle Program for Road Transportation (2019), https://jdih.setneg.go.id/produk/pp/2019/55/tentang-percepatan-program-kendaraan-bermotor-listrik-berbasis-baterai.

[8] Republic of Indonesia, Presidential Regulation No. 79 of 2023 amending Presidential Regulation No. 55 of 2019 (2023), https://peraturan.go.id/id/perpres-no-79-tahun-2023.

[9] Ministry of Finance, Regulation on Value-Added Tax Borne by the Government for Battery Electric Vehicles (2023), https://jdih.kemenkeu.go.id/en/dokumen/peraturan/pmk-38-pmk010-2023; Ministry of Finance Indonesia, PMK No. 9 of 2024 (2024), https://jdih.kemenkeu.go.id/api/download/125f80d5-de96-4155-8955-f40bb5a93cbf/2024pmkeuangan009.pdf

[10] Henny Sudibyo et al., "Overview of Domestic Components Level in the Indonesian Electric Vehicle Industry's Opportunities," in *AIS Conference Proceedings*, 2023, 040001, https://doi.org/10.1063/5.0121112.

[11] Xueliang Yuan, Xin Liu, and Jian Zuo, "The Development of New Energy Vehicles for a Sustainable Future: A Review," *Renewable and Sustainable Energy Reviews* 42 (February 2015): 298–305, https://doi.org/10.1016/j.rser.2014.10.016.

structures, technical standards, and user-facing platforms through which public charging services are accessed. Private operators and site owners (e.g., shopping centres, toll-road rest areas, hotels, and office complexes) increasingly co-invest in charging points, yet deployment is commonly coordinated through PLN's systems and applications, which affects interoperability and consumer conveniences.[12]

Recent deployment has been rapid but spatially uneven. Four-wheeler public charging points (SPKLU) reportedly expanded by roughly 299 percent between 2023 and 2024, increasing by more than 1,000 units to exceed 3,200, with further additions in early 2025.[13] However, expansion remains concentrated in Java–Bali and major corridors, leaving outer islands and secondary cities comparatively underserved. For a new entrant, this governance and geography matter for market access: concentration reduces range anxiety and improves serviceability in dense urban areas, but it also constrains feasible rollout outside core regions unless the entrant pairs geographic sequencing with partnerships that extend charging coverage and after-sales support.[14]

2.2. Market and Infrastructure Development

2.2.1. Sales dynamics and Investment Commitments

The post-2019 regulatory package has contributed to a step-change in market visibility and investor confidence by combining fiscal incentives with a credible localisation and infrastructure agenda. Reported registrations of battery-electric passenger cars increased from 125 units in 2020 to more than 40,000 units by 2024 approximately five percent of annual new car sales suggesting that Indonesia has moved beyond pilot demand toward early mass-market formation.[15] These sales gains are not independent of policy design: by lowering effective purchase prices through VAT and PPnBM relief (conditional on TKDN compliance), the regulatory regime reduces adoption frictions in a price-sensitive market and signals that the state is willing to underwrite early-stage demand.

Foreign direct investment patterns reinforce this interpretation. Commitments by major manufacturers and battery firms such as plans for high-capacity vehicle assembly, vertically integrated battery production, and complementary charging deployment indicate that investors view Indonesia's EV regime as sufficiently durable to justify fixed-capital

[12] Joko Siswanto et al., "Business Roadmap of Public Electric Vehicle Charging Stations in Indonesia," in *2025 8th International Conference on Electric Vehicular Technology (ICEVT)* (IEEE, 2025), 209–14, https://doi.org/10.1109/ICEVT67191.2025.11184076; A Wiratmoko et al., "Policy Analysis of Electric Vehicle Infrastructure Supporting Sustainable Energy Use," *IOP Conference Series: Earth and Environmental Science* 1267, no. 1 (December 1, 2023): 012036, https://doi.org/10.1088/1755-1315/1267/1/012036.

[13] PLN, "PLN Sukses Tambah Jumlah SPKLU hingga 299% Sepanjang 2024" (2025), https://web.pln.co.id/cms/media/siaran-pers/2024/08/pln-terus-genjot-penambahan-charging-station-kendaraan-listrik-di-berbagai-daerah; Tempo, "PLN's EV Charging Stations Increased by 299 Percent in 2024" (2025), https://en.tempo.co/read/1973958/plns-ev-charging-stations-increased-by-299-percent-in-2024.

[14] Patrick Morrissey, Peter Weldon, and Margaret O'Mahony, "Informing the Strategic Rollout of Fast Electric Vehicle Charging Networks with User Charging Behavior Data Analysis," *Transportation Research Record: Journal of the Transportation Research Board* 2572, no. 1 (January 1, 2016): 9–19, https://doi.org/10.3141/2572-02; Wiratmoko et al., "Policy Analysis of Electric Vehicle Infrastructure Supporting Sustainable Energy Use."

[15] International Institute for Trade and Development (ITD), *Indonesia's Electric Vehicle Industry: Opportunities and Challenges* (2024), https://www.itd.or.th/wp-content/uploads/2024/02/Indonesia-EV-industry-opportunities-and-challenges.pdf; P3DI DPR RI, *Perkembangan Populasi Kendaraan Listrik di Indonesia 2020–2024* (2025).

investments.[16] At the same time, these investments raise the competitive bar for late entrants: scale economies in assembly and batteries, coupled with the reputational strength of incumbent brands, can translate into lower unit costs and faster dealer-network expansion.[17] Market structure is therefore becoming bifurcated, with Chinese and regional brands capturing much of the early battery EV segment, while Japanese incumbents retain dominance in internal-combustion and hybrid categories an indicator of strong brand inertia and potential switching costs for consumers.[18] For PT ISVO, the implication is that entry must be differentiated and sequenced, leveraging policy-linked pricing while building credibility through service and infrastructure alignment.

2.2.2. Charging Infrastructure Roll-out

Indonesia's charging build-out has accelerated, yet adequacy remains constrained by both scale and spatial inequality. PLN reports more than 3,700 four-wheeler public charging points (SPKLU) in operation by early 2025, alongside nearly 10,000 two-wheeler charging points and more than 2,000 battery-swapping stations, supplemented by a large base of home-charging installations.[19]

Public–private co-investment has been important for this expansion, particularly in commercial sites and toll-road corridors where chargers are frequently co-branded and integrated with PLN's digital platforms. Nevertheless, comparative benchmarks suggest that public charging density is still relatively thin. Syntheses cited in the manuscript estimate a national average of roughly 21 EVs per public charger, compared with best-practice reference ratios closer to 17:1.[20]

More consequential for market entry is the geographic skew: Java–Bali concentration supports viable early adoption niches, but thinner coverage in secondary cities and outer islands amplifies range anxiety and complicates after-sales logistics. An entrant's rollout strategy must therefore treat infrastructure as a binding constraint.[21] For PT ISVO, this points to a corridor- and city-first deployment strategy, complemented by bundled home-charging solutions and charging partnerships that reduce perceived inconvenience and extend the feasible catchment beyond the densest urban centres.

2.3. Consumer Preferences and Adoption Barriers

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[16] Financial Times, "Hyundai and LG Energy Open Indonesia's First Battery Cell Factory," 2024, https://www.ft.com/content/b9ecf63a-596b-4dda-9445-c21669734d7c.

[17] Xhavit Islami et al., "Barriers Hindering the Entry of New Firms to the Competitive Market and Profitability of Incumbents," *Management* 24, no. 2 (December 18, 2019): 121–43, https://doi.org/10.30924/mjcmi.24.2.9.

[18] GAIKINDO, Indonesia EV Sales Statistics 2024–2025 (2025), https://www.gaikindo.or.id/penjualan-mobil-listrik-nasional-naik-segmennya-mencapai-empat-persen/.

[19] PLN, "PLN Sukses Tambah Jumlah SPKLU hingga 299% Sepanjang 2024" (2025), https://web.pln.co.id/cms/media/siaran-pers/2024/08/pln-terus-genjot-penambahan-charging-station-kendaraan-listrik-di-berbagai-daerah.

[20] Triyono Widi Sasongko et al., "Identification of Electric Vehicle Adoption and Production Factors Based on an Ecosystem Perspective in Indonesia," *Cogent Business & Management* 11, no. 1 (December 31, 2024): 1–22, https://doi.org/10.1080/23311975.2024.2332497. *See also* d International Institute for Sustainable Development (IISD), Indonesia's Electric Vehicle Boom: A Temporary Trend or a Long-Term Vision? (2025), https://www.iisd.org/articles/deep-dive/indonesian-electric-vehicle-boom-temporary-trend-or-long-term-vision.

[21] Namwoo Kang, Fred M. Feinberg, and Panos Y. Papalambros, "Integrated Decision Making in Electric Vehicle and Charging Station Location Network Design," *Journal of Mechanical Design* 137, no. 6 (June 1, 2015): 1–10, https://doi.org/10.1115/1.4029894.

2.3.1. Segmentation of Indonesian EV Consumers

Consumer evidence highlights that Indonesia's emerging EV market is heterogeneous, with clear implications for entry positioning, distinguishes three broad groups: current EV owners (around 7%), prospective adopters (approximately 78%), and sceptics (about 15%).[22] Owners are predominantly metropolitan and tend to have higher incomes and reliable access to private parking; their usage intensity and experience make them sensitive to charging time, operating-cost savings, and environmental benefits. Prospective adopters represent the principal growth segment, but their demand is conditional: although many share urban characteristics and parking access, they often defer purchase decisions due to uncertainty regarding prices, infrastructure coverage, technology maturity, and resale values. Sceptics are more likely to be older and located outside major metropolitan areas, and their deterrents centre on range, charging convenience, battery durability, and depreciation risk.[23]

Academic studies broadly align with these patterns by showing that perceived usefulness, environmental concern, and social influence support purchase intention, while perceived risk and infrastructure limitations materially depress it.[24] More ecosystem-oriented work further indicates that adoption and production depend on coordination among government, industry, and charging-network providers, not only consumer attitudes.[25] For PT ISVO, segmentation implies that early commercial traction is most plausible among urban prospects rather than entrenched sceptics; the entry strategy therefore needs to reduce perceived risk through credible service commitments, convenient charging access, and transparent information on lifetime costs.

2.3.2. Price Sensitivity and Willingness to Pay

Across available surveys, affordability emerges as the dominant constraint on four-wheeler EV adoption in Indonesia. PwC Indonesia identifies a "sweet spot" for battery EVs in the IDR 323–484 million range, with particularly strong demand for models priced at or below IDR 300 million.[26] Complementary survey evidence also suggests that price is the most salient attribute in purchase decisions and that many respondents are unwilling to pay a premium over comparable internal-combustion vehicles.[27] This pattern implies that incentives linked to VAT and PPnBM relief are strategically consequential: they can shift a model into a viable price band, but only if entrants maintain eligibility through TKDN compliance.

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[22] PwC Indonesia, Indonesia's Electric Vehicle Readiness and Consumer Insights 2024 (2024), https://www.pwc.com/id/en/pwc-publications/industries-publications/consumer-and-industrial-products-and-services/indonesia-electric-vehicle-survey-2024.html.

[23] Martono Martono, M Gary Gagarin Akbar, and Y Rahmatiar, "Law Enforcement of Transnational Cybercrime: Case Study in Indonesia," *De Lega Lata: Jurnal Ilmu Hukum* 10, no. 2 (2025): 279–86; Chaikal Nuryakin et al., "Socioeconomic Impacts and Consumer Preferences Analysis of Electrified Vehicle in Indonesia," in *2019 6th International Conference on Electric Vehicular Technology (ICEVT)* (IEEE, 2019), 80–93, https://doi.org/10.1109/ICEVT48285.2019.8993989.

[24] Astuti and Susanto, "Challenges of Electric Vehicle Adoption in Indonesia: Revealing the Hidden Factors Affecting Purchase Intention."

[25] Sasongko et al., "Identification of Electric Vehicle Adoption and Production Factors Based on an Ecosystem Perspective in Indonesia."

[26] PwC Indonesia, Indonesia's Electric Vehicle Readiness and Consumer Insights 2024 (2024), https://www.pwc.com/id/en/pwc-publications/industries-publications/consumer-and-industrial-products-and-services/indonesia-electric-vehicle-survey-2024.html.

[27] Achmad Manshur Ali Suyanto and Widi Sriwahyuni Pasaribu, "Analysis of Indonesian Society's Preferences for the Presence of Electric Vehicles," *International Journal of Professional Business Review* 8, no. 10 (October 6, 2023): e03324, https://doi.org/10.26668/businessreview/2023.v8i10.3324.

Total cost of ownership (TCO) arguments can mitigate, but not eliminate, price sensitivity. Economic analyses indicate that EV diffusion can reduce fuel imports and generate macroeconomic benefits, yet high upfront costs and limited model variety continue to suppress household uptake, particularly among lower-middle-income consumers.[28] For PT ISVO, the strategic implication is to treat affordability as a design constraint through disciplined feature selection and financing options while communicating TCO in concrete, verifiable terms that address depreciation and battery-replacement concerns.

2.3.3. Adoption Drivers and Barriers

Evidence from surveys and systematic reviews converges on a set of interlocking adoption drivers and barriers that operate through four domains: economic constraints, infrastructure conditions, technology perceptions, and policy awareness. Economically, high upfront prices, uncertainty about resale values, and perceived complexity of subsidy access reduce willingness to adopt, while expected savings in running costs and maintenance provide an offsetting incentive. Infrastructure limitations particularly sparse public charging outside primary corridors, limited redundancy, and long charging times relative to refuelling translate into range and convenience anxiety.[29] Technology-related concerns include battery degradation, safety, interoperability with evolving standards, and replacement costs. Finally, uneven policy implementation and limited public awareness can blunt the effectiveness of incentives by increasing transaction costs and uncertainty.[30]

For PT ISVO, these barriers imply that compliance with technical standards is necessary but insufficient. Effective entry requires a bundled value proposition: credible battery and powertrain warranties, visible and reliable service arrangements, access to charging (including home-charger packages where feasible), and communication that translates incentives and TCO into consumer-relevant metrics.

Figures 1 presents a synthesis of survey data on Indonesian society's preferences for electric vehicles, illustrating the relative importance of key attributes such as purchase price, operating costs, charging availability, and environmental benefits. The visualization confirms that affordability and charging access dominate consumer consideration sets, while secondary factors such as brand origin and aesthetic features exert comparatively weaker influence. For PT ISVO, this hierarchy validates the strategic emphasis on pricing within incentive-eligible bands and bundled charging solutions, while suggesting that marketing investments should prioritize tangible economic and infrastructure assurances over peripheral product differentiation.

[28] Damanik et al., "A Comprehensive Analysis of the Economic Implications, Challenges, and Opportunities of Electric Vehicle Adoption in Indonesia."

[29] Farshid Javadnejad et al., "Analyzing Incentives and Barriers to Electric Vehicle Adoption in the United States," *Environment Systems and Decisions* 44, no. 3 (September 28, 2024): 575–606, https://doi.org/10.1007/s10669-023-09958-3.

[30] Ferhat Akkuş and Mehmet Zerrakki Işık, "A Review of Thermal Management Systems of Lithium-Ion Batteries Used in Electric Vehicles," *Journal of Traffic and Transportation Engineering (English Edition)* 12, no. 6 (December 2025): 1763–83, https://doi.org/10.1016/j.jtte.2025.06.002.

Code	Attribute	Level
A1	Purchase price	• <Rp.300.000.000 • Rp.300.000.000-Rp.800.000.000 • >Rp.800.000.000.
A2	Driving range	BEV: • 150 Km • 350 Km • 500 Km (Ščasný et al., 2018)
A3	Infrastructure availability charging station	BEV: • Low: (20% gas stations + in some public places) • Medium: (60% gas station + in the middle of a public place) • High: (90% gas stations + in almost all public places) (Ščasný et al., 2018).
A4	Incentive policy	• 1%-2% • 3%-4% • >5%
A5	Vehicle type or load	• Cup (2 Seat) • Halvkombi (5 Seat) • Kombi (8 seat) (Chowdhury et al., 2016)

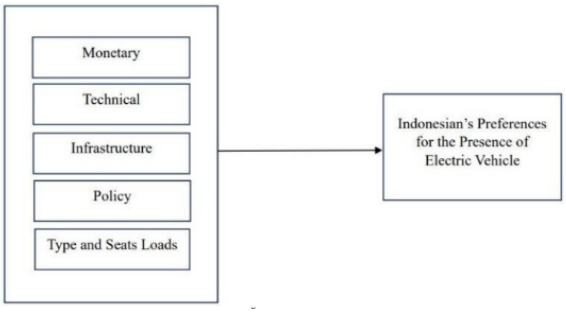


Figure 1: Conjoint analysis results: Indonesian consumer preferences for Electric Vehicle Attributes[31]

3. Discussion

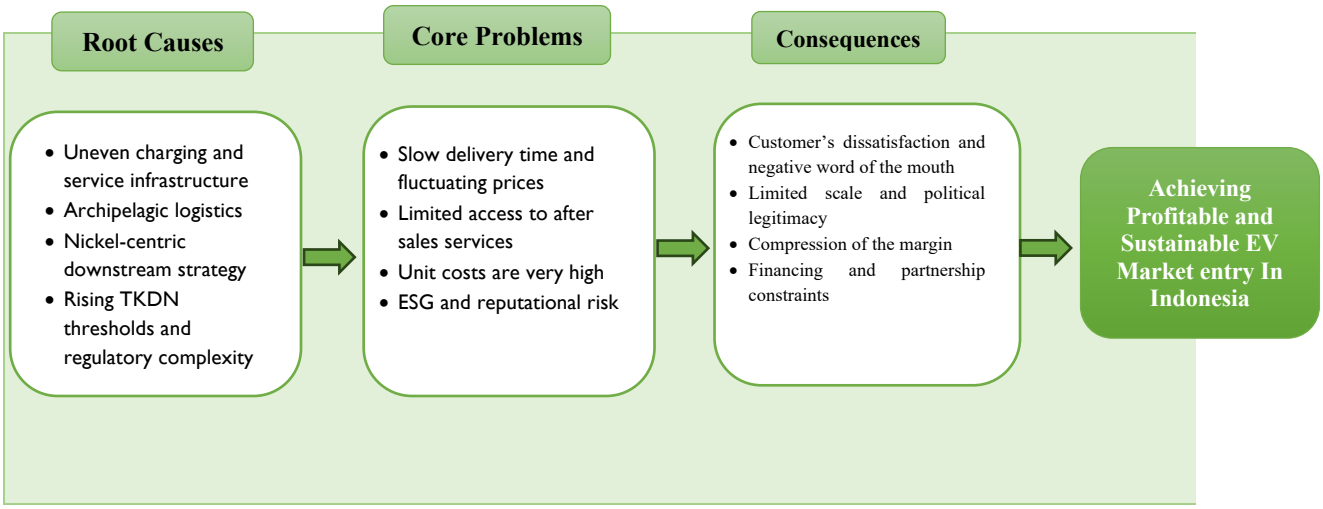
3.1. Operational and Supply-Chain Challenges: A Problem-Tree Perspective

To translate the preceding regulatory and market evidence into an entrant-focused diagnosis, this section develops a mutually exclusive, collectively exhaustive (MECE) problem-tree. The MECE logic requires that structural drivers be defined as non-overlapping categories and that causal pathways be made explicit, reducing the risk of double counting and clarifying which constraints are binding for strategy.[32] Applied to PT ISVO, the problem-tree links four root causes (i) uneven charging and service geography, (ii) archipelagic logistics, (iii) nickel-centric down streaming, and (iv) tightening TKDN requirements to operational bottlenecks that can erode commercial viability. Figure 2 visually maps how these four root causes translate into operational bottlenecks and, ultimately, commercial consequences for a new entrant navigating Indonesia's EV market.

[31] Suyanto and Pasaribu, "Analysis of Indonesian Society's Preferences for the Presence of Electric Vehicles."

[32] Minh Tung Tran, "Effective Strategic Business Problem Analysis through Algebraic Methods and MECE Framework," *TPM – Testing, Psychometrics, Methodology in Applied Psychology* 32, no. S4 (2025): 1732–50.

Figure 2: MECE Problem tree: Ev Market Entry in Indonesia



Source: Authors` Illustrations

3.1.1. Root Causes and Associated Operational Risks

First, charging and service infrastructure remains concentrated in Java–Bali and selected corridors despite rapid deployment, leaving many outer-island markets underserved. For PT ISVO, this concentration acts as a geographic constraint: it narrows the feasible early-sales footprint and raises the cost of honouring warranties and service commitments in peripheral regions. Second, Indonesia's archipelagic geography creates fragmented, multimodal distribution chains across road and sea routes, increasing lead times and inventory risk for vehicles and spare parts. This logistics structure can translate into delivery delays, uneven regional pricing, and higher working-capital requirements each of which is strategically consequential in a price-sensitive market.[33] Third, the nickel-based down streaming strategy expands domestic battery and materials capacity, but it also increases exposure to ESG and reputational risks where projects are linked to carbon-intensive power and contested social impacts. For PT ISVO, this risk can affect access to finance and partnerships with global suppliers or OEMs that require traceability and emissions disclosure. Conversely, as Issa G. Ahmed demonstrates in Tanzania, effective engagement with local institutional frameworks can drive both business viability and broader sustainability goals.[34] Fourth, rising TKDN thresholds and regulatory complexity increase compliance costs and create incentive-linked pricing risk: failure to meet eligibility criteria can remove VAT/PPnBM relief, pushing retail prices above the market's willingness-to-pay bands.

3.1.2. Core Problems

[33] Maminiaina Heritiana Sedera Rakotoarisoa et al., "Influence of Positive Psychological Capital on Social Entrepreneurship Intention During Covid-19," *International Journal of Economics and Business Issues* 1, no. 1 (December 31, 2022): 28–43, https://doi.org/10.59092/ijebi.vol1.Iss1.8.

[34] Issa G. Ahmed, "The Agricultural and Financial Cooperatives as Driver for Tanzania's Economic Sustainability: Promoting SDG 8 and 9.," *International Journal of Research and Innovation in Social Science* 9, no. 10 (November 12, 2025): 4532–39, https://doi.org/10.47772/IJRISS.2025.910000374.

These root causes manifest as four interrelated operational bottlenecks. Delivery times can be slow and prices volatile across regions due to fragmented logistics and uneven stock distribution. After-sales access remains limited outside major metropolitan areas, undermining consumer confidence in a technology perceived as complex (Lera-Romero et al., 2024). Unit costs are structurally high for a new entrant operating below break-even volumes, particularly when imported components and logistics costs dominate the bill of materials. Finally, ESG and reputational exposure in nickel-intensive supply chains can restrict financing options and complicate partnerships, especially where stakeholders demand credible governance and reporting.[35]

3.1.3. Consequences for Market Entry

If unaddressed, these bottlenecks predictably translate into downstream commercial risks. Service delays and charging inconvenience can produce dissatisfaction and negative word-of-mouth, which is particularly damaging in early adoption phases when reputational signals are amplified. This reputational vulnerability echoes broader patterns of community exclusion documented by Bakari Khatib Faki and Issa G. Ahmed in Zanzibar, where weak governance structures led to severe social consequences for marginalized groups. Geographic concentration of sales can limit scale and weaken political legitimacy claims tied to national industrial objectives.[36] Cost pressures can compress margins because price-sensitive consumers resist increases needed to cover logistics, service, and compliance costs. Finally, ESG-related uncertainty can constrain access to capital and alliances, as investors and international partners increasingly condition engagement on traceability and emissions performance.[37] Recognising these causal linkages is necessary for a market-entry strategy that extends beyond marketing to the operational realities of sustainable growth.

3.1.4. Strategic Market-Entry Roadmap for PT ISVO

The market-entry roadmap is framed as an integrated strategy that links positioning and sequencing choices to the binding constraints identified in the MECE diagnosis. The guiding principle is to enter where infrastructure density and purchasing power make adoption feasible, while using partnerships and a staged localisation plan to sustain incentive eligibility and manage supply-chain and ESG risks.

a) Strategic positioning

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[35] O Battaia, R Oloruntoba, and R Guillaume, "Preventing Adverse Environmental And Social Outcomes In Sustainable Value Chains In Nickel Extraction And Refining," in *Proceedings of the Conference on Production Systems and Logistics*, 2024, https://doi.org/10.15488/17771; Giannis T. Tsoulfas, "Building Resilient and Sustainable Supply Chains through ESG Integration," in *2024 IEEE 15th International Colloquium on Logistics and Supply Chain Management (LOGISTIQUA)* (IEEE, 2024), 1–8, https://doi.org/10.1109/LOGISTIQUA61063.2024.10571432.

[36] Bakari Khatib Faki and Issa G. Ahmed, "Social Consequences of Witchcraft Accusations: Marriage, Divorce, and Community Exclusion in Zanzibar," *Pancasila International Journal of Applied Social Science* 3, no. 03 (November 4, 2025): 517–33, https://doi.org/10.59653/pancasila.v3i03.1999.

[37] Sérgio Dominique-Ferreira, Helder Vasconcelos, and João F. Proença, "Determinants of Customer Price Sensitivity: An Empirical Analysis," *Journal of Services Marketing* 30, no. 3 (May 9, 2016): 327–40, https://doi.org/10.1108/JSM-12-2014-0409; Tsoulfas, "Building Resilient and Sustainable Supply Chains through ESG Integration"; Tam Thien Vo, Xinning Xiao, and Shuk Ying Ho, "How Does Corporate Social Responsibility Engagement Influence Word of Mouth on Twitter? Evidence from the Airline Industry," *Journal of Business Ethics* 157, no. 2 (June 8, 2019): 525–42, https://doi.org/10.1007/s10551-017-3679-z.

PT ISVO should position itself as an urban-oriented, pragmatic EV brand that competes on affordability and reliability rather than on premium experimentation.[38] Given the documented willingness-to-pay bands, the core offer should be an entry variant that can credibly remain at or below the IDR 300 million threshold through a combination of disciplined feature selection and incentive eligibility. Because perceived risk is a principal deterrent for prospective adopters, positioning should be reinforced by visible battery and powertrain warranties, clear service commitments, and transparent communication of total cost of ownership relative to internal-combustion alternatives.[39]

b) Sequenced geographic rollout
Infrastructure concentration implies that national rollout is not immediately feasible. Market entry should begin in a limited set of high-density metropolitan corridors where public charging, private parking access, and service ecosystems are most developed primarily major Java–Bali cities, with selective expansion to other large urban markets that already show charging build-out. Once early cohorts generate utilisation data and service routines, expansion should proceed to secondary cities along established inter-city corridors and to fleet pilots where predictable routes reduce range anxiety. Only after service and parts logistics are stabilised should the firm pursue broader archipelagic expansion, pairing distribution with partner-based service capacit.[40]

c) Product, pricing, and financing
Product architecture should be modular to support an affordability-led entry variant and a limited number of upgraded trims without fragmenting after-sales complexity.[41] Pricing strategy should treat tax incentives and TKDN compliance as a commercial necessity, not an administrative afterthought: the base model must be designed to remain within the key price band under realistic localisation pathways. Financing partnerships with banks and multi-finance institutions can address cash-flow constraints through low down payments, lease structures, or balloon-payment options; however, financing products should be tied to warranties, maintenance plans, and residual-value assurances that directly address depreciation and battery-replacement fears.[42]

d) Partnerships, localisation, and ESG integration
Because charging access and service coverage are central adoption constraints and echoing the institutional partnership model Issa G. Ahmed documents in Tanzania,

[38] Romie Oktovianus Bura and Andre Amba Matarru, "Affordability and Acceptability of Autonomous Electric Vehicles in Indonesia in 2024: A Review," *AIP Conference Proceedings* 1 (2025): 020001, https://doi.org/10.1063/5.0282723.

[39] Y Zhang et al., "Factors Influencing Chinese Consumers' Willingness to Purchase Used EVs," *World Electric Vehicle Journal* 16, no. 8 (2025), https://doi.org/10.3390/wevj16080460.

[40] Pei Huang et al., "Geographic Information System-Assisted Optimal Design of Renewable Powered Electric Vehicle Charging Stations in High-Density Cities," *Applied Energy* 255 (December 2019): 113855, https://doi.org/10.1016/j.apenergy.2019.113855; Raj Anand Sundaramoorthy et al., "Smart City Charging Infrastructure," in *Blockchain-Based Solutions for Accessibility in Smart Cities* (IGI Global, 2024), 359–84, https://doi.org/10.4018/979-8-3693-3402-7.ch013.

[41] Erik Greve and Dieter Krause, "An Assessment of Methods to Support the Design of Future Robust Modular Product Architectures," in *Proceedings of the International Design Conference*, 2018, 335–46, https://doi.org/10.21278/idc.2018.0249.

[42] Mark Cowan and Joshua Cutler, "ESG and the Demand for State Tax Incentives," *Florida Tax Review* 27, no. 1 (December 16, 2024), https://doi.org/10.5744/ftr.2023.1003; Tian Kun, Zhuang Xintian, and Huang He, "Research on Lending Decision and Optimization of Supply Chain Finance for Commercial Banks Based on Financial Constraint," in *2017 29th Chinese Control And Decision Conference (CCDC)* (IEEE, 2017), 3340–45, https://doi.org/10.1109/CCDC.2017.7979083.

PT ISVO should pursue charging partnerships that expand visibility and reliability in its initial corridors, while bundling home-charger options for customers with private parking.[43] To reduce capital intensity, after-sales coverage should leverage established service networks supplemented by mobile diagnostics and over-the-air updates where technically feasible.[44] Localisation strategy should follow a staged TKDN roadmap, beginning with components where domestic suppliers are already competitive and scaling to higher-value sub-systems as capabilities mature; this sequencing protects incentive eligibility while avoiding premature capital commitments. Finally, reflecting Muhammad jibril call for localized sustainability frameworks in Muslim-majority contexts, ESG governance should be integrated into supplier selection and disclosure from the outset,[45] given heightened scrutiny of nickel-linked emissions and social impacts.[46] Clear traceability and reporting practices can reduce financing frictions and support partnerships with global firms that face tightening sustainability requirements.

e) Risk management
Strategic execution should be accompanied by scenario-based risk management that tests sensitivity to incentive changes, macroeconomic volatility, fuel-price dynamics, and input-price fluctuations. Operationally, the roadmap should preserve flexibility in battery chemistry and sourcing strategies to manage nickel price risk and potential shifts toward lower-nickel technologies, while maintaining compliance with evolving standards and external sustainability regulations.[47]

4. Conclusion and Policy Implications

Indonesia provides an example of how regulations can serve as a driver and a filter of entry of the EV market. To the former, regulations at the presidential level, specific tax breaks, elaborate TKDN regulations and state-led infrastructure developments have turned an immature market into a legitimate opportunity, with multi-billion-dollar investments and an increasingly large EV fleet. Conversely, the identical regulatory density comes with challenging localization, compliance and ESG requirements that can be only fulfilled by well-thought-out entrants.

For PT ISVO, the roadmap implies an integrated set of strategic priorities rather than a sequence of independent actions. First, product design and pricing must be anchored in observed willingness-to-pay, with an entry variant that can remain within the sub-IDR 300

[43] Ahmed, "The Agricultural and Financial Cooperatives as Driver for Tanzania's Economic Sustainability: Promoting SDG 8 and 9."

[44] Amin Akbari and Matthew D. Dean, "Peer-to-Peer Residential Charger Sharing: Exploring Public Perceptions in California," *Transportation Research Part D: Transport and Environment* 144 (July 2025): 104788, https://doi.org/10.1016/j.trd.2025.104788; Govindaraj Ramkumar et al., "The Future of Green Mobility: A Review Exploring Renewable Energy Systems Integration in Electric Vehicles," *Results in Engineering* 27 (September 2025): 105647, https://doi.org/10.1016/j.rineng.2025.105647.

[45] Abubakar Muhammad jibril, "Decolonizing Sustainability: Integrating Islamic Legal Pluralism into Post-2030 Agendas," *Reformasi Hukum* 29, no. 2 (August 30, 2025): 154–67, https://doi.org/10.46257/jrh.v29i2.1229.

[46] Tan Thai Nguyen, Viet Thanh Nguyen, and Sy Tien Do, "Unveiling Systemic Barriers to Circular Economy in Construction for Sustainability: A Structural-Causal Network Perspective," *Engineering, Construction and Architectural Management*, October 28, 2025, 1–21, https://doi.org/10.1108/ECAM-05-2025-0770.

[47] Jiří Fotr et al., "Scenarios, Their Concept, Elaboration and Application," *Baltic Journal of Management* 10, no. 1 (January 5, 2015): 73–97, https://doi.org/10.1108/BJM-01-2014-0004; Yose Supriyadi and Charla Wara Hardani, "Information System Risk Scenario Using COBIT 5 for Risk And NIST SP 800-30 Rev. 1 A Case Study," in *2018 3rd International Conference on Information Technology, Information System and Electrical Engineering (ICITISEE)* (IEEE, 2018), 287–91, https://doi.org/10.1109/ICITISEE.2018.8721034.

million band while transparently communicating total cost of ownership. Second, geographic expansion should be sequenced to match charging and service density, beginning with core urban corridors and expanding only as logistics and service routines stabilise. Third, partnerships in charging, after-sales, finance, and supply chains are necessary to manage capital intensity and operational complexity while sustaining TKDN-linked incentive eligibility. Fourth, ESG and nickel governance should be treated as a strategic differentiator that shapes access to capital and international partnerships, not merely as a compliance requirement. Indeed, weak governance in resource-adjacent communities can lead to severe human rights violations,[48] underscoring that for a market entrant like PT ISVO, proactive social risk management is essential for long-term legitimacy and operational stability.

For other resource-endowed economies across Asia and Africa, Indonesia's experience offers two broader lessons. Consistent and predictable regulation that aligns fiscal incentives with industrial-policy objectives can catalyse private investment and early consumer adoption. However, long-term success also depends on continued regulatory learning and course correction, particularly to address spatial inequality in infrastructure deployment and to ensure that down streaming strategies remain compatible with emerging sustainability requirements.

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[48] *See compare* Abubakar Muhammad Jibril, Ramalina Ranaivo Mikea Manitra, and Arafat Hossain, "Life after Accusation: Forced Internment, Human Rights Violations, and the Urgent Case for Criminalizing Witchcraft Claims in Ghana," *Priviet Social Sciences Journal* 5, no. 8 (August 8, 2025): 57–72, https://doi.org/10.55942/pssj.v5i8.443.

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