

Indonesia's Electric Vehicle Outlook

SUPERCHARGING
TOMORROW'S
MOBILITY

JULY 2023



Electrifying Indonesia: A Vision for Sustainability and Prosperity

As Indonesia's Coordinating Minister of Maritime and Investment Affairs, I am pleased to receive this report from AC Ventures and the Indonesian Electric Mobility Ecosystem Association (AEML). It provides a comprehensive analysis of the potential growth trajectory of the electric vehicle (EV) sector in our nation.

The transition to electric mobility represents a strategic national decision with dual objectives: promoting a sustainable future and stimulating significant economic growth. Given our resource abundance and strategic location, Indonesia has a unique opportunity to emerge as a central player in the global EV market. This objective is a long-term commitment that extends for decades to come.

Climate change demands immediate, decisive action. The introduction and adoption of EVs will allow Indonesia to reduce carbon emissions substantially, contribute to global sustainability efforts, and generate significant economic returns. An integral part of this transition is the development of a comprehensive EV ecosystem, which cannot be achieved overnight. It demands a holistic and sustainable approach, requiring continuous commitment from the public and private sectors to ensure the proper development of the industry.

Our advantage as the world's leading nickel producer, a critical element in lithium-ion batteries, amplifies our potential to contribute significantly to the global EV battery supply chain. This represents a robust investment opportunity for industry stakeholders.

With the rise in demand for EVs, particularly from the expanding middle class, the Indonesian government is taking proactive measures. We are shaping policy frameworks that enhance the quality and affordability of EVs, thereby promoting their adoption. A pivotal aspect of our strategy is Presidential Regulation No. 55 signed in 2019, outlining the government's commitment to support the EV industry.

“Electric vehicles are important because they can reduce our dependency on imported energy and reduce emissions.”



We have set targets to have 13 million electric motorbikes and 2 million electric cars on our roads by 2030.

Our renewable energy goals are ambitious, aiming to increase the contribution of renewables to 23% of the country's energy by 2025, up from about 9% in mid-2020. By 2056, we plan to complete a broader nationwide energy transition. These initiatives align with our commitment under the Paris Agreement to reduce our emissions by 32% by 2030 and achieve a net-zero emissions goal by 2060 or earlier.

Recognizing the challenges ahead, we acknowledge the importance of nurturing the EV ecosystem holistically. Major breakthroughs, such as the investment in a new aluminum industry in East Java, signify the development of the supporting ecosystem crucial for the sustainability of EVs.

This report by AC Ventures and AEML serves as a tool to deepen our understanding of the EV sector. It outlines the current state and future direction of the industry, including growth trajectory, technological trends, policy impacts, and potential obstacles.

This report may serve as a strategic guide, providing insights to investors, businesses, policymakers, and the public. The information herein may help us adapt our strategies, maximize opportunities, and manage risks.

The imminent EV revolution requires a collective effort. This report can potentially aid collaboration, strategic decision-making, and informed investments in our long-term journey toward an electrified future.

Luhut Binsar Pandjaitan

Coordinating Minister of Maritime and Investment Affairs, Indonesia

Spark of Change: Redefining Transportation for a Thriving Nation

Based on the enhanced Nationally Determined Contribution document, transportation is considered a part of the energy sector. This sector emphasizes energy conservation and the utilization of new and renewable energy in controlling greenhouse gas emissions.

In order to reach the goal outlined above, the Ministry of Transportation has implemented a financial incentive policy. This policy waives certain fees for the KBLBB type test, the KBLBB Type Test Certificate, and for the conversion of motorized vehicles. Specifically, the costs for the Type Test Certificate and Certificate Type Test Registration have been reduced to IDR 0.

Through the instructions of the Ministry of Transportation concerning the implementation and acceleration of using battery-based electric motorized vehicles, we are putting effort into promoting and implementing the roadmap for transitioning operational service vehicles from electric motorized vehicles to battery-based electric motorized vehicles.

Regarding vehicle conversion, the total number of motorcycles converted, as per the Type Test Certificate and the Type Test Registration published as of May 12, 2023, can be confirmed as 178 units. At present, we have 25 certified and ten non-certified workshops that specialize in motorcycle conversions. We are actively encouraging the growth of both these categories, as we aim to increase the overall number of conversion workshops for motorcycles and other vehicles.

As of June 21, 2023, there are 70,242 electric vehicles in Indonesia. Two-wheeled vehicles account for the majority of these, with 53,734 units, followed by four-wheeled vehicles with 16,102 units. Three-wheeled vehicles number 316 units, buses 80 units, and goods vehicles ten units.

Currently, the Ministry of Transportation is finalizing the revision of a regulation concerning the conversion of

“To establish an EV ecosystem in Indonesia, synergy and collaboration between the government, automotive industry players, and the community are essential.”



electric motorcycles into battery-based electric motorcycles. This is to support the acceleration of type test services for converted motorcycles.

In the future, conversion workshops will be divided into two clusters, and the implementation of type testing will not only be conducted at the roadworthiness testing and motor vehicle certification center but also at all testing locations in Indonesia – private testing, public service agencies, and conversion workshops that have been accredited.

To establish an electric vehicle ecosystem in Indonesia, synergy and collaboration between the government, automotive industry players, and the community are essential. The government hopes that stimulating the use of electric vehicles will increase energy efficiency and energy conservation in the transportation sector, while also improving air quality and, most importantly, reducing our dependence on imported fuel.

I would like to express my appreciation to AC Ventures and AEML for supporting the government’s program to improve the battery-based electric motor vehicle ecosystem in Indonesia.

Budi Karya Sumadi
Minister of Transportation, Indonesia

Shifting Gears: The Future of the Green Revolution

As Minister of Industry, I am pleased with this comprehensive report on the emergent and dynamic landscape of the Indonesian electric vehicle (EV) industry. It demonstrates our nation's unwavering dedication to the development of environmentally favorable technology and serves as a road map to our progression toward lower emissions and sustainable development.

In addition, it highlights the innovators and investors responsible for our forward momentum.

In an effort to reduce emissions, our government promotes the use of electric vehicles. Recognizing that incentive programs play a significant role in fostering green innovation, we have implemented a strategy that prioritizes benefits based on emission levels rather than conventional engine capacity.

The distinction between these initiatives and a carbon tax exemplifies our considerate approach to sustainable development.

On the basis of the accomplishments of the Low-Cost Green Car (LCGC) program, we are incorporating valuable lessons and newly acquired knowledge into our evolving policies. Simultaneously, we are implementing incentives for domestically manufactured electric vehicles with a local component level exceeding 40%, with the intent of bolstering innovation and entrepreneurship in Indonesia.

Our vision for electric mobility is firmly established at the intersection of technology and imagination. Multiple automakers contribute to our comprehension of market dynamics and how to develop cutting-edge technology to meet the escalating demand for green transportation through the use of distinctive strategies and methodologies. While competition in the sector promotes economic development, it also accelerates our collective efforts to reduce greenhouse gas emissions.

“The growth of electric vehicle (EV) sales indicates public readiness in Indonesia, with the electric mobility market having the potential to develop at a CAGR of 58.5% through 2030.”



This imminent EV shift represents a once-in-a-generation opportunity for Indonesia to cultivate a thriving domestic market, which is far from being a straightforward manufacturing endeavor. It encourages local industries to innovate and develop scalable EV technology. Indonesia has the potential for long-term growth, aided by innovative research and development, despite difficulties and competition. We must capitalize on this opportunity.

We must not forget our commitment to the international community to attain net-zero emissions by 2060. This broader perspective guides us as we structure our EV ecosystem, recognizing its potential to generate employment opportunities in addition to economic value.

Understanding the EV industry is not just a matter of academic interest; it's an investment necessity. Beyond the obstacles of traffic and emissions, the sector's growth and job creation offer significant economic benefits. With our climate commitments and economic objectives in sight, the EV industry represents an opportunity that we cannot afford to pass up.

The increasing sales of electric vehicles already indicate the public's readiness to implement clean transportation. The Indonesian EV market is expected to develop at a CAGR of 58.5% between 2023 and 2030, according to projections.

This report by AC Ventures and AEML outlines a strategic plan for advancing Indonesia's electric vehicle (EV) industry. It emphasizes fostering innovation and sustainability while augmenting the quality of life for all Indonesians.

Agus Gumiwang Kartasasmita
Minister of Industry, Indonesia

The Mission to Catalyze Indonesia's EV Ecosystem

Indonesia is committed to addressing climate change by transitioning its energy landscape to be powered by more sustainable sources.

Achieving Indonesia's target of net zero emissions by 2060, or sooner, is no easy feat. We need to prioritize the decarbonization of industries that contribute the most emissions.

Mobility is a significant contributor to carbon emissions in Indonesia. Therefore, electrifying Indonesia's transport network by establishing a sustainable electric mobility industry is a critical part of the overall net zero emissions goal.

Given the multifaceted nature of this emerging industry and the presence of strong incumbent players, it's crucial to foster collaborative efforts among key players in the electric vehicle (EV) ecosystem. This should be supported by a comprehensive regulatory environment.

In executing the mandate set out by President Jokowi in Perpres no.55/2019, Inpres no.7/2022, and Permen ESDM no.1/2023, Indonesia's state-owned enterprises are implementing various strategic efforts to build an end-to-end, integrated EV ecosystem.

Pertamina, along with its sub-holding company, Pertamina New & Renewable Energy, is spearheading various strategic efforts in EV ecosystem development, particularly in battery packing, infrastructure, and battery-as-a-service.

PLN, the nation's sole electricity provider, is also establishing a network of swapping and charging stations.

AEML is a forum and a non-profit organization that acts as the industry body, thought leader, and public policy advocate for the EV ecosystem. AEML engages, sustains, and grows the EV ecosystem through partnerships with vehicle brand owners, component

“Our mission to electrify mobility in Indonesia is based on a calling to protect the environment by reducing pollution for future generations.”

suppliers, battery providers, and infrastructure players.

AEML values collaborative efforts, sharing best practices, and benchmarking with other countries.

We partner with the government of Indonesia, international organizations, key actors in the EV ecosystem, as well as other associations, to reach out to more people and promote a positive campaign for EVs.

Our mission to electrify mobility in Indonesia is based on a calling to protect the environment by reducing pollution for future generations.

AEML is committed to supporting the adoption of EVs and fostering the creation of a globally competitive EV ecosystem.

Dannif Utojo Danusaputro

AEML Chairman



Why we made this report...

“With a total addressable market exceeding US\$20 billion and a confluence of key factors already at play, Indonesia’s EV landscape is set for significant expansion.”



When we set out to make this report, the aim was to provide an in-depth analysis of the Indonesian electric mobility market, highlighting its potential for substantial growth in the coming decade.

With a total addressable market exceeding US\$20 billion, the confluence of various factors, such as a rising demand for sustainable, convenient, and cost-effective transportation solutions, supportive government policies, and an ever-evolving electric vehicle (EV) technology landscape, sets the stage for significant expansion.

The electric mobility industry plays a crucial role in Indonesia’s net-zero emissions and energy transition aspirations, as mobility accounts for around 20% of the country’s carbon emissions. Further, Indonesia’s abundance of natural resources for the EV supply chain ecosystem and its history of local vehicle manufacturing further amplify the market’s potential.

The dynamic nature of this space presents significant opportunities for startups across the entire value chain of electric mobility, from production and charging infrastructure to battery management software-as-a-service (SaaS) and financing, poised for exponential growth with the support of a favorable local ecosystem.

This report provides an overview of the current state of the market, highlighting opportunities and challenges, enabling stakeholders to make informed decisions and capitalize on this electrifying space.

Whether you are an institutional investor, a startup founder, or government stakeholder, we hope this study will prove useful for you, as Indonesia’s electric mobility future unfolds into reality.

Michael Soerijadji

Founder & Managing Partner, AC Ventures

Indonesia's US\$20B+ opportunity: Electric mobility drives energy transition.

OVERVIEW				
	Estimated Indonesia market size (\$B, 2030)	Indicative EBIT	Headwinds	Tailwinds
Cell manufacturing and battery mgmt. system	3-4.5	5-8% ²	Supply-chain challenges, increasing commodity costs	Rise in pro-domestic manufacturing targets and regulation
Auto R&D and manufacturing	12.5-15	10-12% ²	Rising battery / component costs (e.g., lithium)	Growing e-2W demand, given lower cost and denser urbanization in SEA
Vehicle sales and dealership	1-2 ¹	6-10% depends on OEM partnership, agreements, discounts, etc.	Pressure on dealer margins due to higher EV costs and rise of online OEM sales channels	Growing consumer EV demand and consumer subsidies by government
Charging infrastructure	2-3	Profitability has yet to be proven in US markets	Uncertain / changing government regulations	Commercial operators building onsite charging to attract traffic
Service, maintenance and battery recycling ³	0.5-1.5	4-8% ²	Reduced aftersales care required for EVs vs. ICE	Potential emergence for end-of-life battery mgmt. market/recycling

ASSESSMENT					
	Adoption readiness	Regulatory support	Scalability	Room for local player	Overall assessment for Indonesia
Cell manufacturing and battery mgmt. system	✓	✓	✓	✓	Raw material advantage (rich in nickel, cobalt, and other rare earth metals)
Auto R&D and manufacturing	✓	✓	✓	✓	Potential to scale e-2Ws manufacturing with foreign and local OEMs
Vehicle sales and dealership	✓	✓	✓	✓	
Charging infrastructure	✓	✓	✓	✓	Limited opportunity for new player to deal major 4W brands, EV-only pure-plays are rare
					Opportunity for 2Ws manufacturer to partner with fleet companies (e.g., ride-hailing) to develop EV ecosystem
					Opportunity for local corporate to scale and operate, smaller opportunity for battery swapping, dominated by OEMs
Service, maintenance and battery recycling ³	✓	✓	✓	✓	Smaller opportunity as hardware/R&D limited in SEA
					Very early, as EV adoption is driven by lower servicing needs and costs compared to ICE vehicles and limited battery supply.

● Attractive ● Opportunistically attractive ● Nascent

Note: 2W refers to two-wheelers (e.g., motorbike) and 4W refers to four-wheelers (e.g., car); (1) Does not include leasing/secondhand market; (2) Based on global players; (3) Battery recycling industry not expected to be sizeable by 2030 since EV industry is still nascent in SEA and the average battery life is 10 years

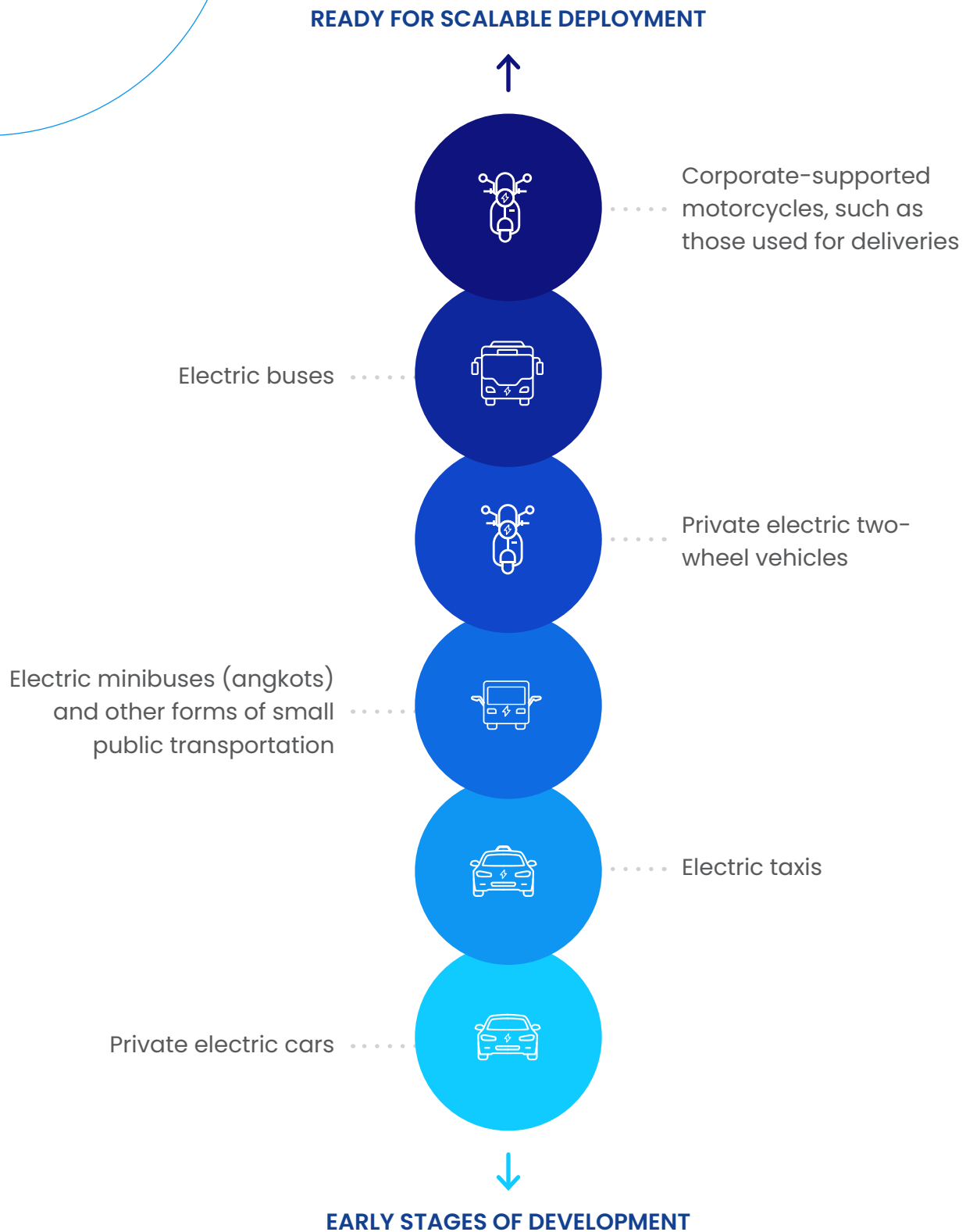
Sources: Bain Temasek Green Economy Report, Team analysis

Indonesia has taken significant steps in recent years to establish a strong foundation for a prosperous electric vehicle industry.

Key Events Timeline in Indonesia's Electric Vehicle Ecosystem



Current readiness and priority status of EV segments in the Indonesian market:



Sources: IESR, Press Search

Two national electric vehicle production targets exist, but the lack of a unified governing body causes implementation problems.

1

2019 General Plan of National Energy (RUEN)



Target of
2,200

battery electric vehicles (BEVs) by 2025



Target of
711,000

hybrid cars by 2025



Target of
2.1 million

battery electric bikes (BEVs) by 2025



Target of
100%

electric vehicle (EV) sales by 2040

2

Ministry of Industry Plan for 2020/21



Target of
400,000

battery electric vehicles (BEVs) by 2025



Target of
1.8 million

battery electric bikes (BEVs) by 2025



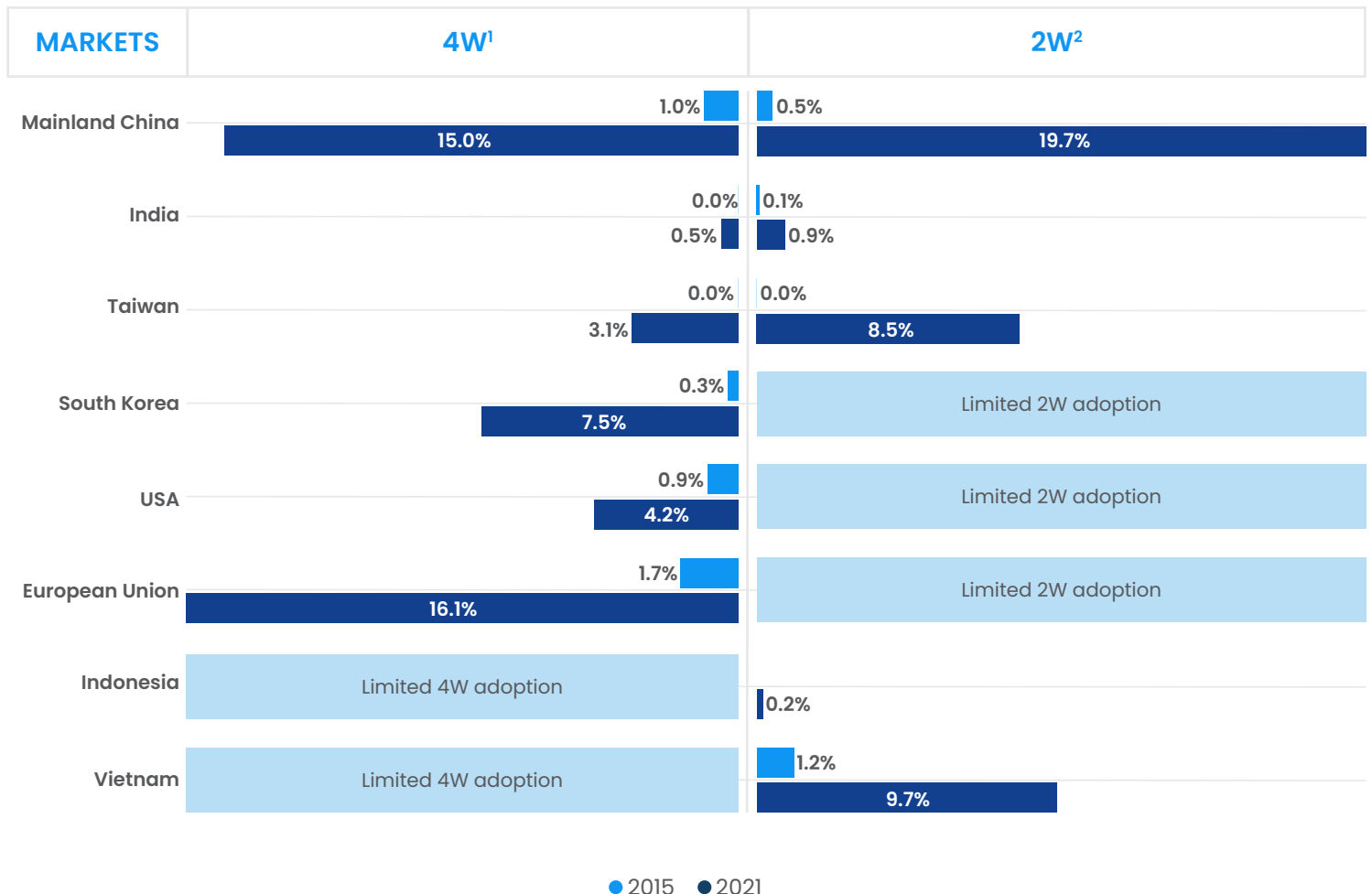
Target of
29.3%

reduction in greenhouse emissions by 2030

Sources: RUEN, KEMENPERIN, AHK

Indonesia's current EV penetration level is similar to China's ten years ago, indicating significant growth potential.

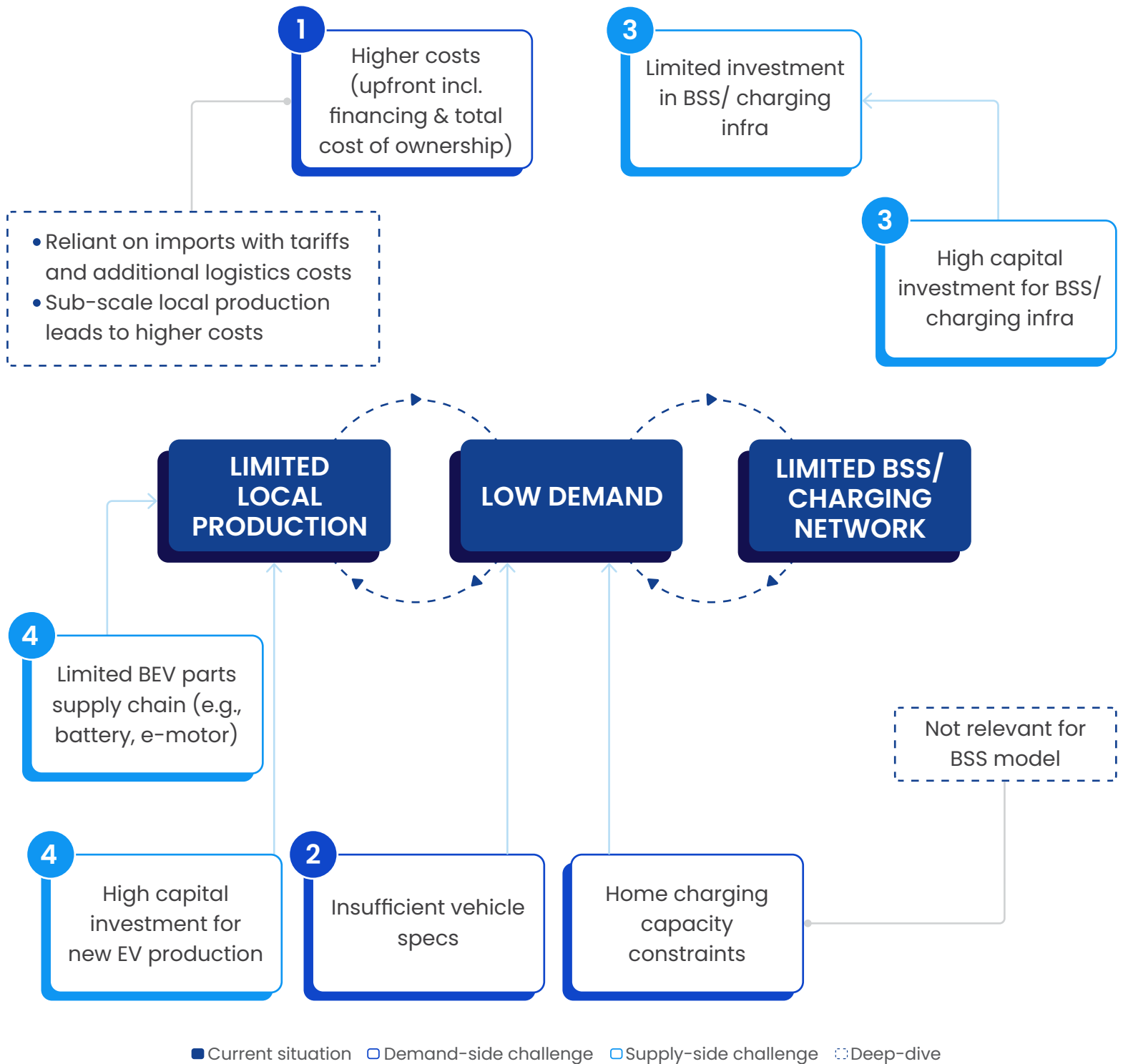
EV Penetration



1. BEV + PHEV sales of total passenger car vehicle sales
2. Excluding bicycles

Sources: IEA, Statista, ICCT

Local ecosystems need to address several challenges to achieve the government's EV growth plans



BSS: Battery Swapping Station, BEV: Battery Electric Vehicle

Sources: Stakeholder Interviews, BCG Analysis



KEY PLAYERS & INFRASTRUCTURE

Developing the electric vehicle ecosystem in Indonesia involves several key players such as state-owned enterprises Pertamina and PLN for infrastructure, and Indonesia Battery Corporation for collaborations with foreign giants like LG Chemical and CATL for battery production.

Major brands like Hyundai, BYD, and Tesla dominate the 4W space, while the 2W space is fragmented with local and low-cost global original equipment manufacturers competing for market share.

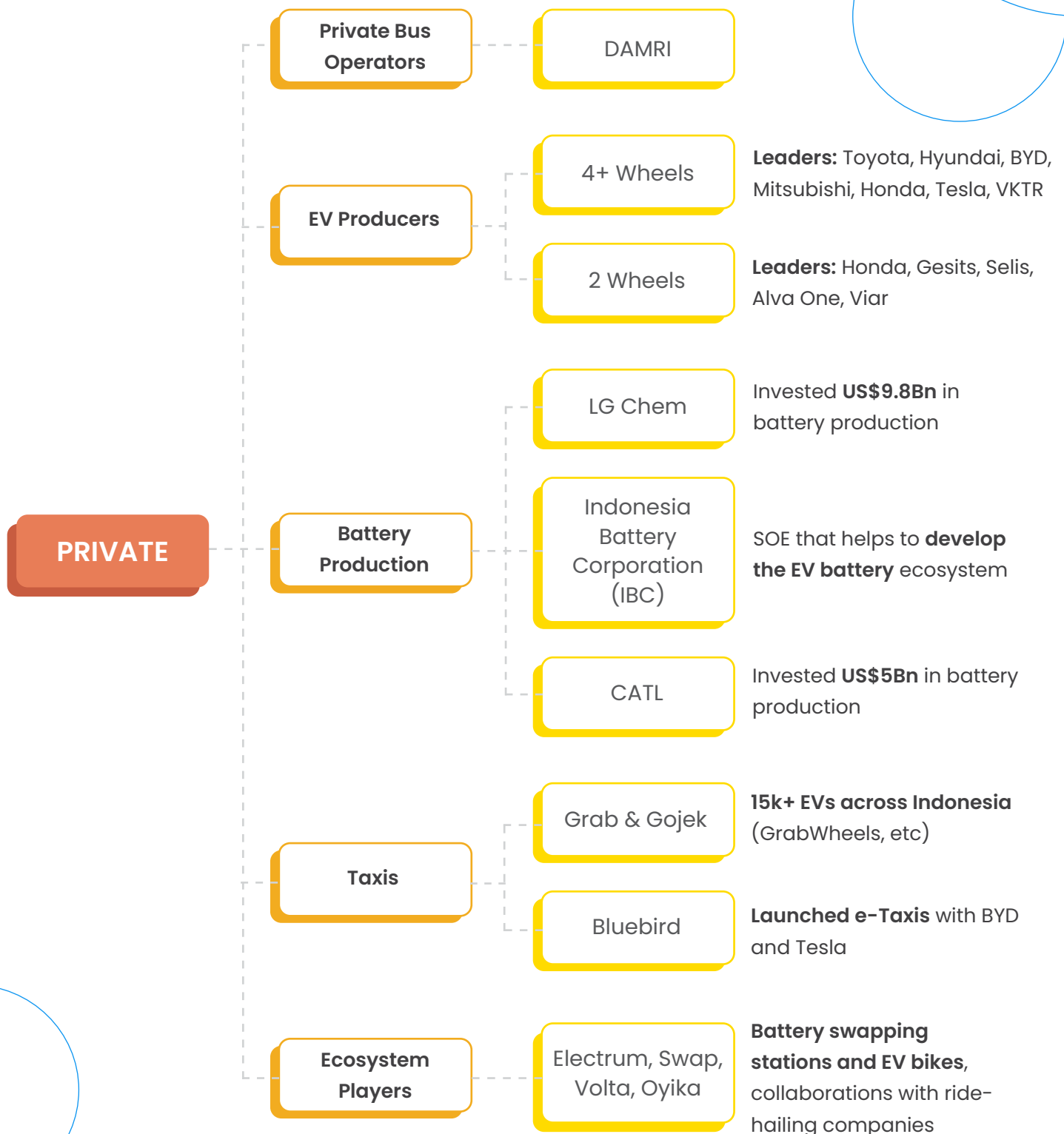
B2B channels, such as Grab and Bluebird, have shown promising results in implementing EVs in their fleets, alongside Damri and TransJakarta. These companies are collaborating to establish a more sustainable and eco-friendly transportation system in Indonesia.

As of now, there are 439 general charging stations and 961 battery swap stations available for electric vehicles in Indonesia. These stations provide charging options for electric cars, bikes, and buses, but the infrastructure is expected to expand with the growth of the industry.

PLN has set a target of building 6,316 general charging stations and 14,000 battery swap stations by 2025 to facilitate the growth and adoption of electric vehicles.

Key players in the Indonesian electric vehicle ecosystem





Sources: ADB, Catapult, Press Search

We must accelerate the construction of EV charging facilities to keep up with the increasing demand for EVs

Charging stations in operation



As of Q4 2022, there are 439 high-powered general charging stations available in 328 public locations for EV charging.

The target is to have 2,500 charging stations by 2025 and 7,000 by 2030.

Battery swapping stations in operation



As of Q4 2022, there are 961 battery swap stations in Indonesia.

This is well below the stated targets (4,000 by end of 2020, 14,000 by 2025, and 52,000 by 2030).

The potential scale for battery swapping stations is hindered by the varying battery types and requirements, indicating the need for a unified infrastructure that can accommodate multiple brands.

Sources: DJK, ESDM, Databoks



Sales & Localized Production

As of Q4 2022, **33,600 EVs** were registered in Indonesia, with 7,600 four-wheel EVs on the roads, a significant increase from 230 previously.

The sales growth is mainly driven by affordable Chinese companies like Wuling, as well as higher-end brands that have committed over US\$3 billion for 4-wheeler manufacturing in Indonesia. Despite this growth, the target sales goal of 400,000 units by 2025 according to the Ministry of Industry plan suggests there is still significant untapped market potential for EVs in Indonesia.

The two-wheel vehicle market in Indonesia is growing rapidly. In 2020, 1,947 two-wheel EVs were registered, with local production from 15 companies with a capacity of 877,000 units per year. As of end-2022, there were already 26,000 2-Wheeler EVs on the road, driven by B2B usage and direct consumer purchases. The Ministry of Industry's updated plan aims to sell 750,000 units by 2025, reflecting the high demand for two-wheel vehicles in Indonesia.

Significant investments have been made for EV production in Indonesia for 2W and 4W vehicles

Investments by large, global original equipment manufacturers in 4W



In 2019, announced an investment of **US\$1.5B** to produce EVs in West Java plant



In 2020, announced an investment of **US\$370M** to produce EVs in Indonesia

TOYOTA

In 2020, announced an investment of **US\$2B** to produce EVs in Indonesia

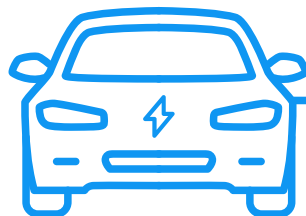


In 2021, announced an investment of **US\$779M** to produce hybrid and battery EVs in Bekasi



Invested **US\$1B** from 2015–2021 for localized EV production in Indonesia

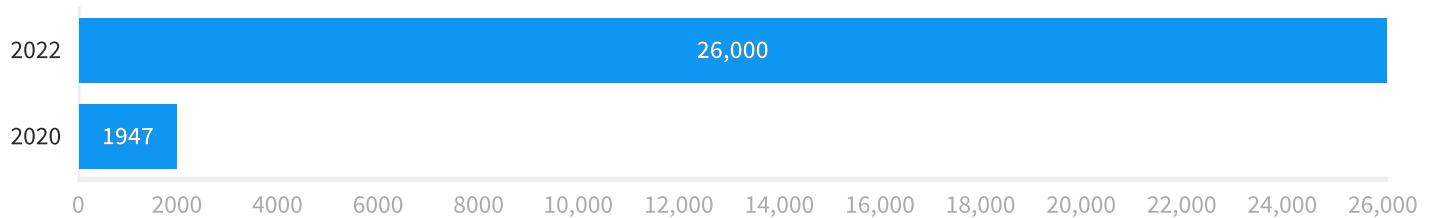
Numbers



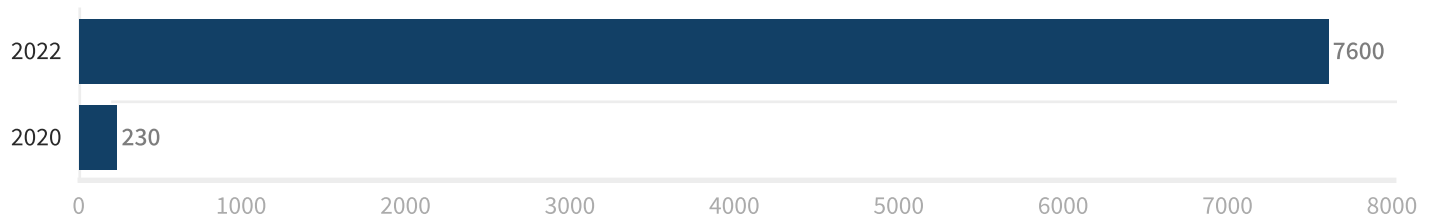
33,600
EVs

were registered
in Indonesia as
of Q4 2022.

2W (number in units)



4W (number in units)



Sources: ESDM, AISI, Katadata

Local players investing in the 2W ecosystem

Company	Investors
	 
	 
	 
	 

B2B partnerships have accelerated electric vehicle adoption

Most 2W EV sales today are to businesses that use them for their fleet of delivery couriers and field agents

Companies	Initiatives
Grab Indonesia	Has operated 14,000 electric vehicle fleets. The numbers accumulated since electrification started in 2019.
Lazada Logistics	Through its logistics unit Lazada Logistics, in collaboration with PT Smoot Motor Indonesia (Smoot) as an electric vehicle provider.
PLN	Use 264 Gesits Electric Motors for operational vehicles.
SiCepat Ekspres	In collaboration with PT TFAS Energi Indonesia (TEI) in purchasing 10,000 units of Volta electric motorbikes for operational vehicles.

Sources: Kompas, Indotelko, PLN, Kontan

“The EV paradigm in Indonesia brings opportunities to address the environment, boost the economy, and embrace sustainable transportation. Soul Parking is excited to support widespread EV adoption by providing and collaborating on charging infrastructure. Together, we can drive the transition to electrification, shaping a brighter and more sustainable future for Indonesia.”

 **Soul Parking**

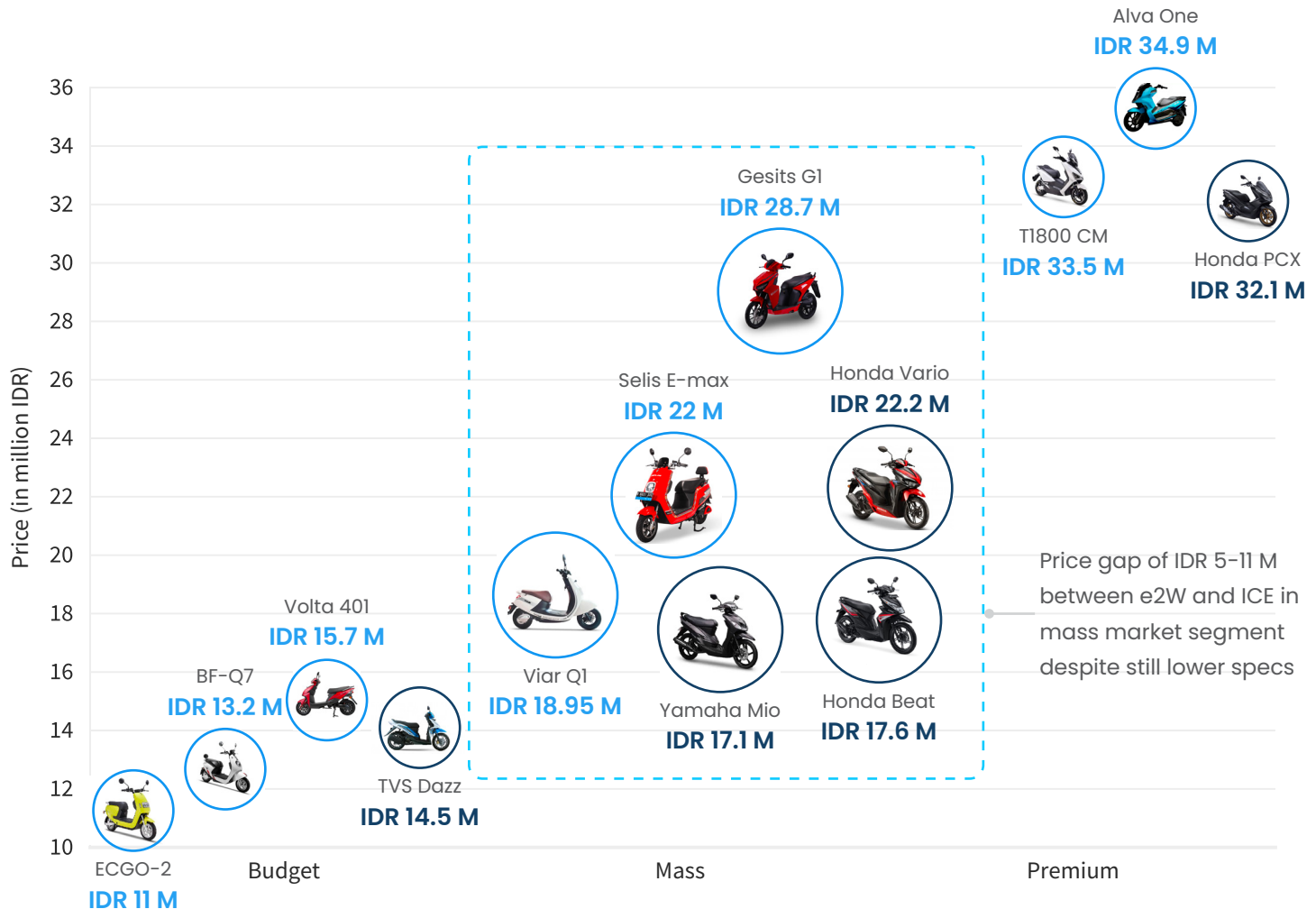
Kenneth Darmansjah

Co-founder & CEO, Soul Parking

kenneth@soulparking.co.id



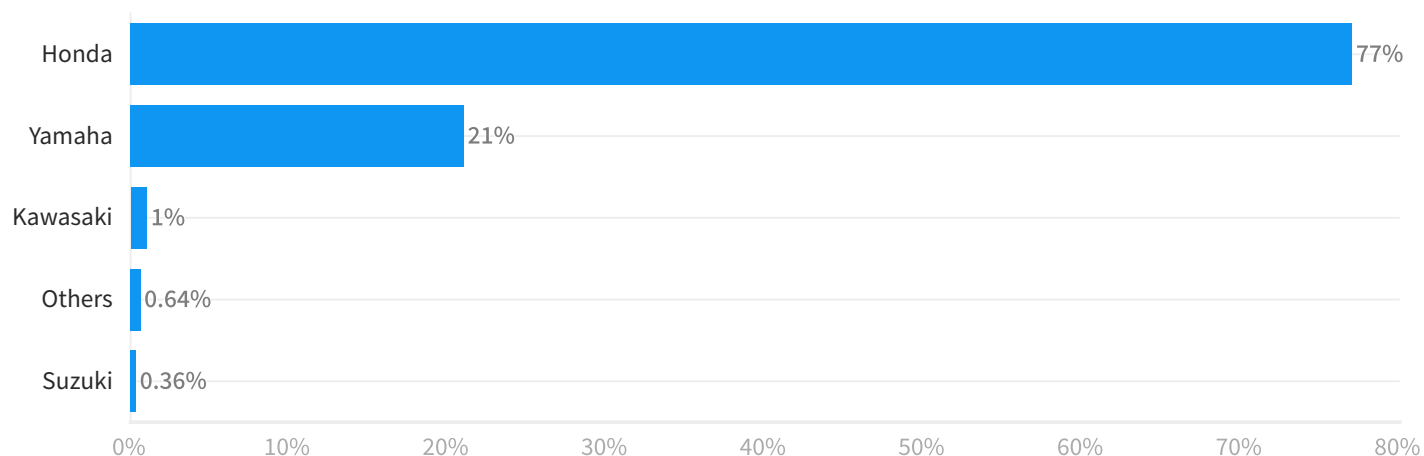
Indonesia's 2W market shows potential for an EV trend, but key gaps and needs remain.



- EVs are still relatively expensive compared to traditional vehicles, unless government subsidies or incentives are factored in.
- EVs still have lower range, speed, and incline capacity than similarly priced internal combustion engine (ICE) vehicles, which affects their overall quality.

Local producers may gain more power in Indonesia's 2W market with the shift to EV, which has been dominated by Japanese players.

Motorcycle sales (2021-2022)



Sources: Indonesia Automobile Association, Press Search

- Motorcycle purchases in Indonesia are heavily reliant on leasing, where Astra FIF (which has the same parent company as Honda motors) is one of the strongest players
- Big 4 brands have heavy dealer networks and distribution, allowing for heavy presence in Tier-2 and 3 cities
- In Japan, the Big 4 are teaming up on motorcycle development & testing, in addition to developing a shared swappable battery platform for their e-motorbikes
- Japanese players are moving slow in EV adoption due to lack of expertise and fear of losing market share.
- Local producers have the advantage of similar starting points and the ability to learn from successful EV markets in China and India.



Public Sentiment

Public knowledge on EVs:

63% of the public is knowledgeable about electric bikes, while 46% are knowledgeable about electric cars.

Public perception:

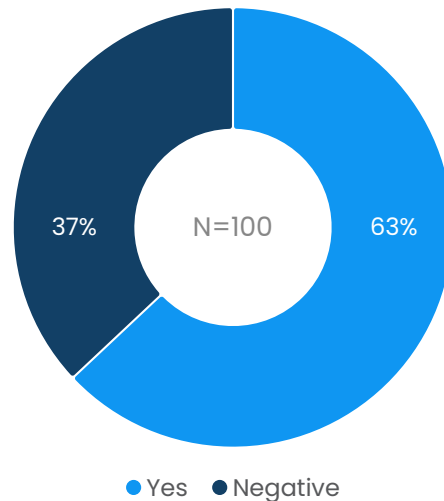
The public views EVs positively for fuel efficiency and lower operating costs but is relatively indifferent toward their environmental impact.

A lack of incentives and infrastructure hinder adoption. Subsidies and visibility of infrastructure may improve this perception.

Public awareness of EVs has improved, but concerns about quality, design, and infrastructure remain.

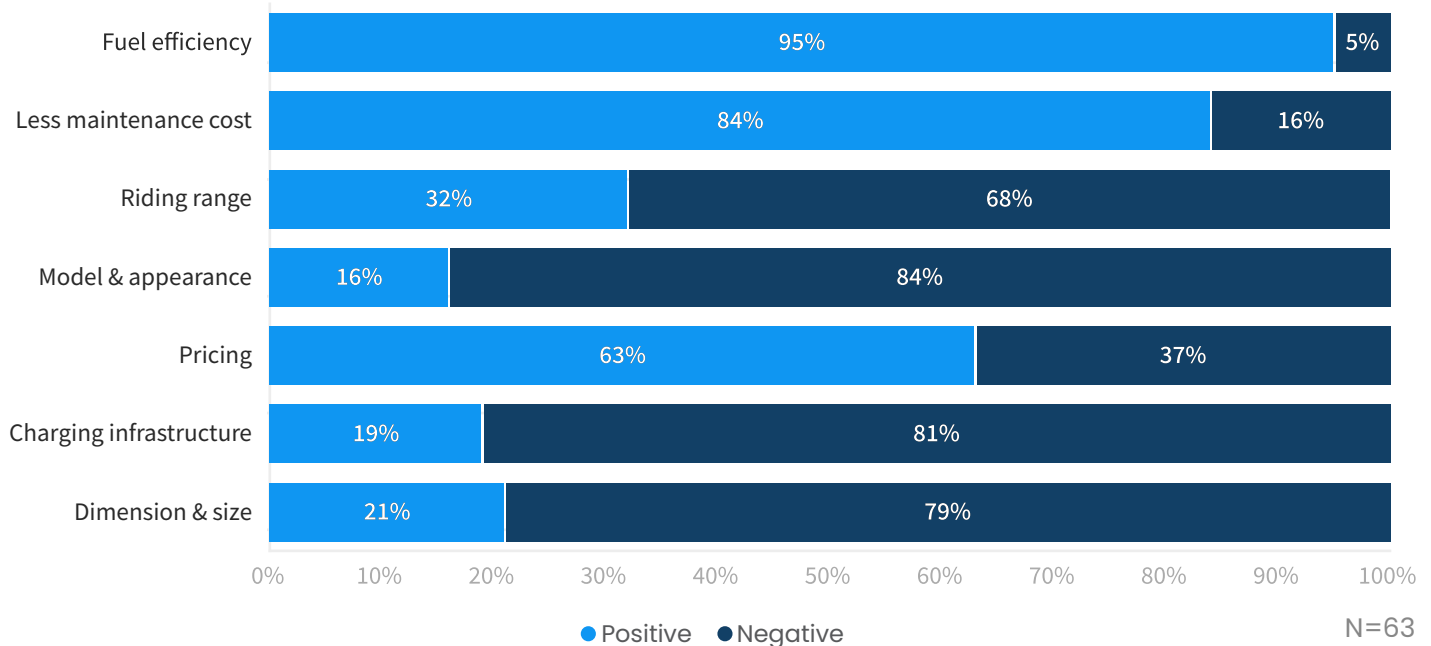
Awareness on electric vehicles

Do you know Indonesia already has an e-motorcycle model available for purchase?



Perception on electric vehicles

What is your first impression on e-motorcycle features in general?

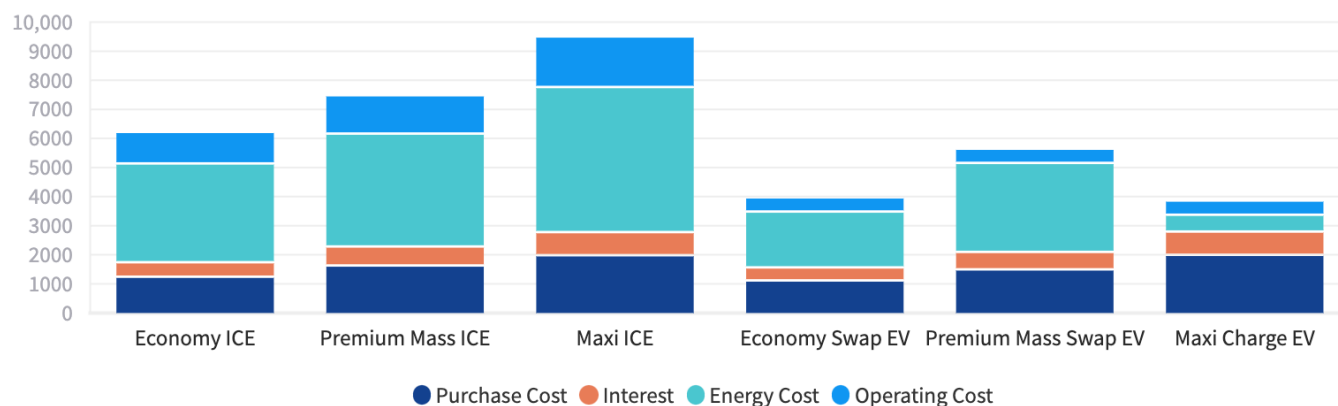


Source: BCG

EV positive campaign and infrastructure development, including battery charging and swapping infrastructure, are important to accelerate EV adoption in Indonesia.

Electric bikes have shown lower overall operational costs, and can be further reduced via government subsidies.

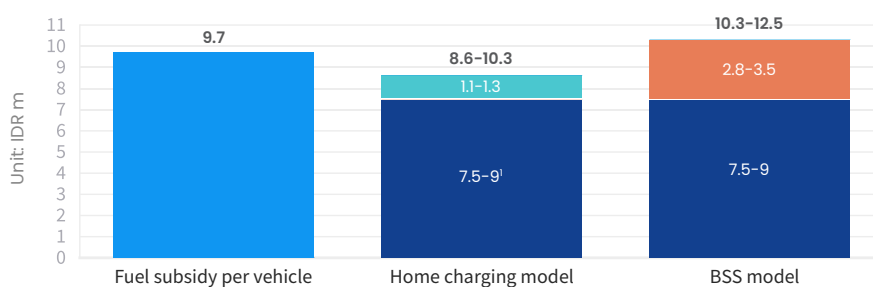
Total cost of ownership for 2 Wheelers
5 Year Total Cost of Ownership (in USD)



- Total cost of ownership for EVs can be significantly lower than that of traditional (ICE) 2-wheelers, given savings from energy costs that can go north of 40% and operating costs savings of 50%.
- However, the majority of purchasing costs (vehicle prices) are still higher than incumbent ICE. EV companies will need to execute strong financing / payment plans to accelerate EV conversion.

Source: Team analysis

Comparison of fuel subsidy spending for ICE and incentives required for e2W over 6-year lifetime



- Funding (incentive) for 1 battery⁴
- Electricity discount from PLN²
- Electricity discount to offer BSS the same rate with SPKLU³

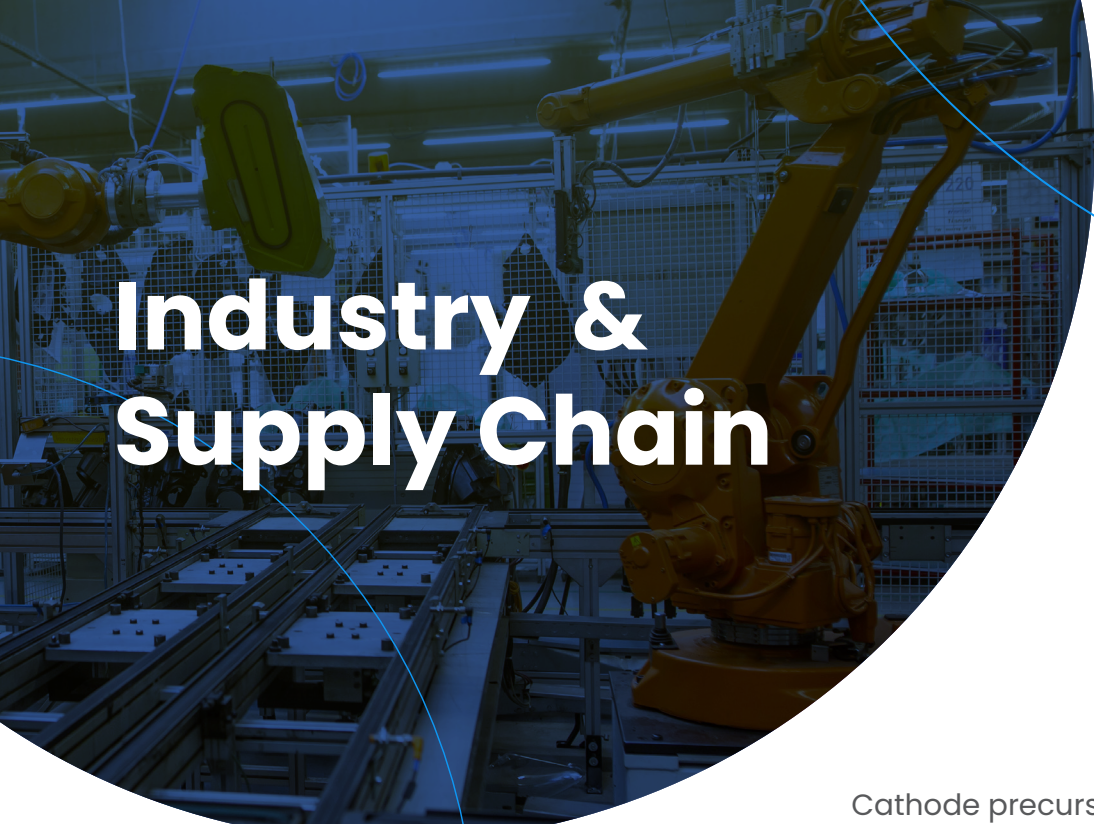
1. Based on average electricity subsidy from PLN

2. Subsidy needed to reduce from IDR 1644/ kWh to IDR 714/ kWh in electricity tariff for BSS

3. For battery of 1.7-3 kWh with the price of \$200-300/ kWh

Note: Assume 6 years as e2W lifetime, average travel distance per vehicle per day is 50 km, ICE fuel efficiency is 50 km/l, electricity efficiency is 1.4-1.7 kWh/ 50 km

Sources: Press Search, BCG Analysis



Industry & Supply Chain

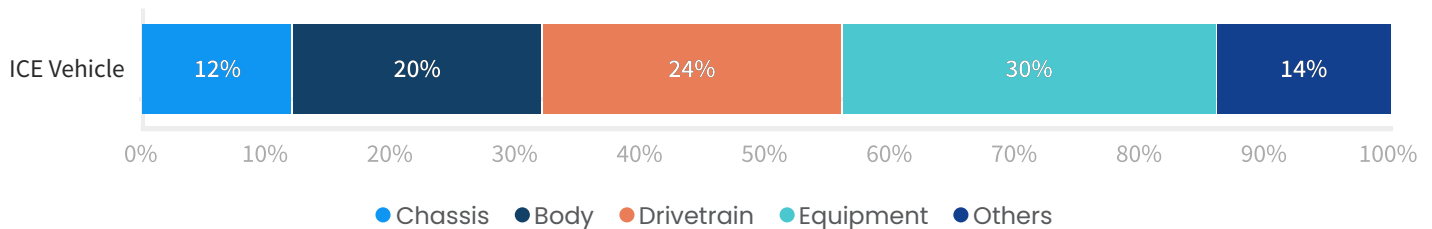
Cathode precursor production in Indonesia is carried out in two locations (Indonesia Morowali Industrial Park and Indonesia Weda Bay Industrial Park). The total investment for this production thus far has reached around **US\$2.6 billion**, indicating significant economic interest in this sector.

For cell and battery module production, the Indonesian government is investing US\$5 billion to build a battery factory backed by CATL. A consortium led by the second largest EV battery maker LG Energy has also set aside US\$9 billion to invest in an integrated battery project in the country with the local supply chain. These investments point to a growing interest in the development and production of batteries in Indonesia.

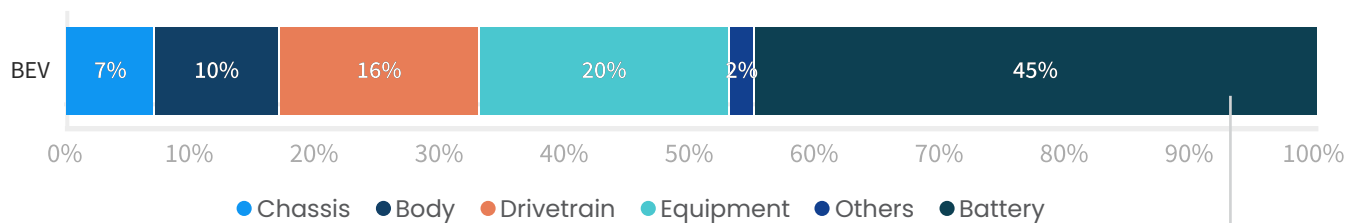
The Indonesian Battery Corporation is a joint venture between Pertamina, PLN, MIND ID, and Antam. This partnership aims to develop both upstream and downstream sectors of the battery industry in Indonesia. With such collaborations and investments, the country is well-positioned to establish a significant presence in the global battery market (estimated to overtake China for nickel processing within 2025) and support the emerging EV industry locally.

The Indonesian ecosystem is poised to benefit from the BEV cost structure

Internal Combustion Engine (ICE) Vehicle cost structure



Battery Electric Vehicles (BEV) Vehicle cost structure



- From the total battery costs, the lithium ion packs currently make up 40-70%
- Nickel, of which Indonesia has 21Mn tons of reserve (the most in the world) makes up an important aspect of the lithium ion build

Due to Indonesia's rich minerals supply, and large demand for vehicles, the Indonesian government has initiated key investments to take part in the production of materials in the supply chain.

As more batteries are stocked and more use cases in play, Indonesia can develop a thriving battery recycling industry in the future as well, further reducing the BEV costs.

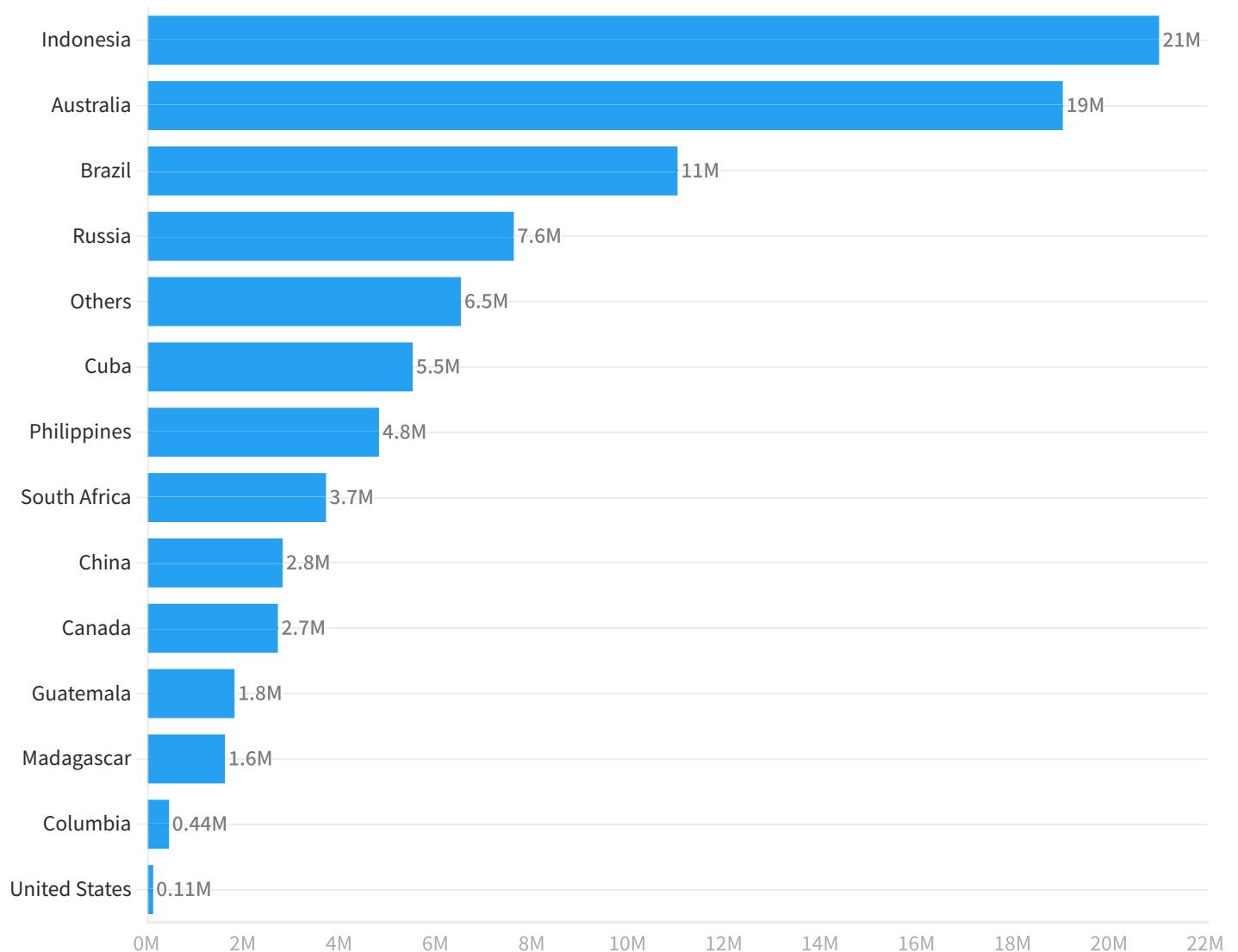
Source: UC Davis

Indonesia's nickel reserves show the country's local strength in raw material

Global Advantage

Indonesia's nickel reserves could fuel its electric vehicle ambitions

Nickel reserves (tons)



Source: U.S. Geological Survey

Indonesia is currently building up its infrastructure across the EV supply chain



Sources: IESR, Press Search



Policy & Regulation

General sentiment:

The overall sentiment toward EVs in the country is positive, but it would need more support from regulators to develop a unified plan.

Financial incentives:

The government offers financial incentives to companies that invest in EVs. For those that invest IDR 10 trillion (~US\$647 million) or more, there is a five-year corporate income tax holiday. Smaller investments are also eligible for mini-tax holidays.

EV owners can benefit from reduced luxury taxes for premium vehicles, while the mass market can enjoy an IDR 7 million (~US\$453) subsidy from March 2023 for 2W EV purchases. 4W EVs will also be given subsidies based on government quota and restrictions.

EV owners can also benefit from improved discounts on electricity for home charging.

Other regulations:

To encourage local production of EVs, there are regulations that require a minimum of 40% local components by 2023. Other regulations include traffic restrictions exemptions.

Policy clusters		Policy	Key authorities
DEMAND	End-user financial incentives	● Lower risk weight of 75% for loans for EV purchasing (compared to 100% for other industries) ● IDR 7 million subsidy for EV-2Wheelers; other subsidies for 4-Wheelers (currently limited to individuals and MSMEs that meet conditions; EVs will have to meet minimum local production requirement)	 Financial Services Authority
	End-user tax incentives	● Luxury goods tax reduction for EVs – 0% for BEV/FCEV if local content requirement met	 Presidential decree  Ministry of Finance
	Preferential access	● Exemption from road restrictions ● Parking fee discount	 Presidential decree
SUPPLY	Manufacturer financial incentives	● Lower risk weight of 75% for loans for EV value chain activities (compared to standard 100%) and exemption from maximum credit limit if guaranteed by BUMN	 Financial Services Authority
	Manufacturer tax incentives	● CIT holiday (up to 20 years) for investment in EV industry ● Import duty exemption on SKD kits for EV	 Presidential decree  Ministry of Finance
	Regulatory hurdle reduction	● Government grants free access to government owned BEV-related technology to EV players	 Presidential decree
	Capabilities building	● Tax deduction of up to 300% of costs incurred in R&D, technological innovation activities and industrial vocation ● Professional certification for battery industry	 Presidential decree

● 4W+2W ● 4W only

Policy clusters		Policy	Key authorities
INFRA. & ENABLERS	Charging network support	- Discounted rate for home power capacity upgrade & special electric price rates up to 30% for home charging 35% – 50% discount on electricity rates given to SPKLU business - Ease of SPKLU licensing (simplified process steps)	 Ministry of Energy & Mineral Resources  State Electric Company
	Industry standardization	Setting up product certification & technical standards for EV industry (standards for EV charging infra. in place)	 Ministry of Energy & Mineral Resources  Ministry of Investment / BKPM  Presidential decree

● 4W+2W ● 4W only

Sources: Presidential Decree, Ministry of Finance, Ministry of Energy & Mineral Resources, Ministry of Investment, PLN, OJK

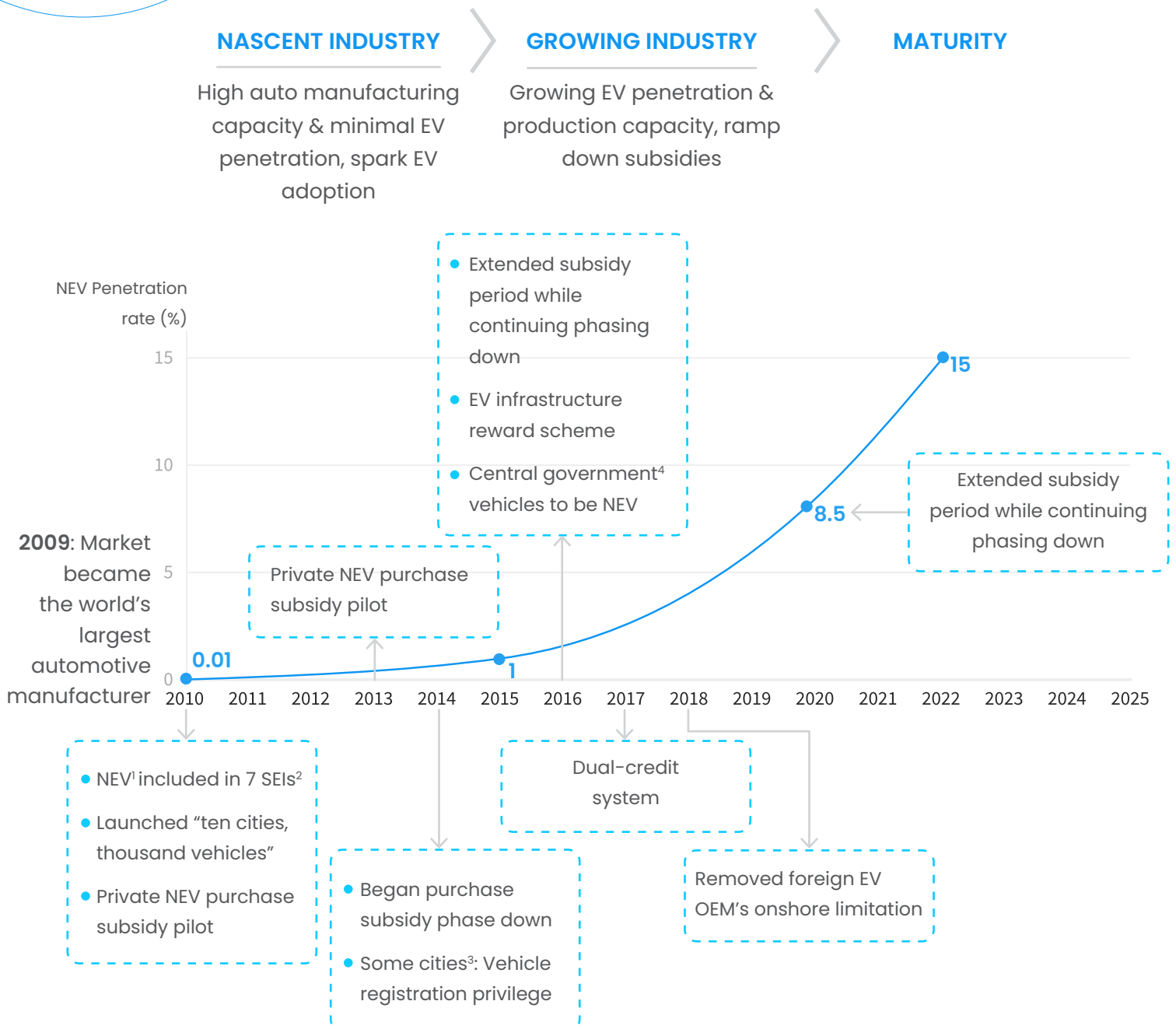
“ We’re at a critical juncture in the transition from internal combustion engines to EVs – a transformation demanding adaptation. Embracing this change, Otoklix is reorienting to become a trailblazer in the EV aftermarket sector, partnering with Segway Motors Indonesia for post-sale services. This move underscores our shared commitment to an electrified future, demonstrating our collective drive for major industry progress. ”



Martin Reyhan Suryohusodo
Co-founder & CEO, Otoklix
martin_reyhan@otoklix.com



Case study: China's government support is helping drive EV penetration



1. NEV = New energy vehicle

2. SEI = Strategic emerging industries

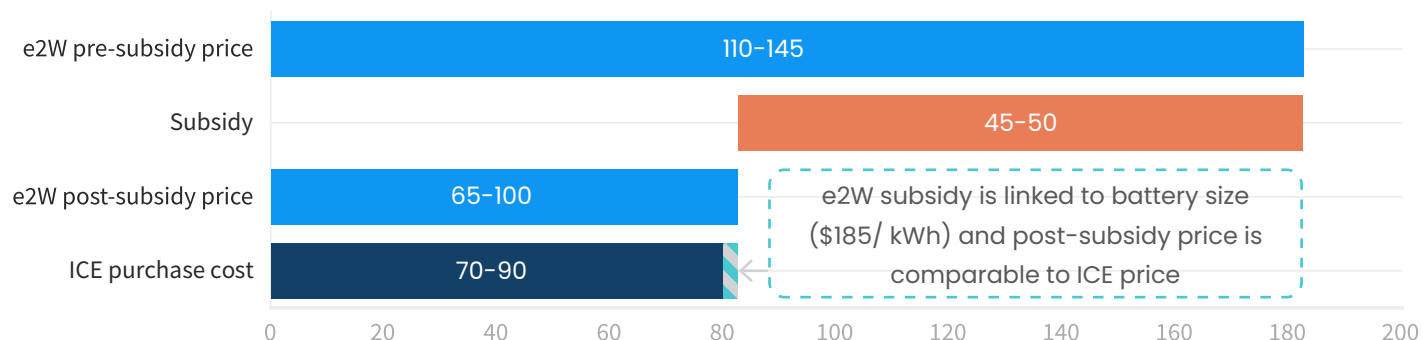
3. Beijing, Shanghai, Guangzhou, Tianjin, Hangzhou, Shenzhen

4. Required half of new vehicles purchased by China's central government be NEV within 5 years

Sources: IEA, ICCT, BCG Analysis

Case study: India's government support is helping drive EV penetration

E2W vs ICE Comparison



Hero Optima CX INR 110 k

Max speed: 45 km/h
Range: 82 km/battery



Hero Splendor Plus INR 70 k

Max speed: 93 km/h
Range: 700 km



Ola S1 INR 145 k

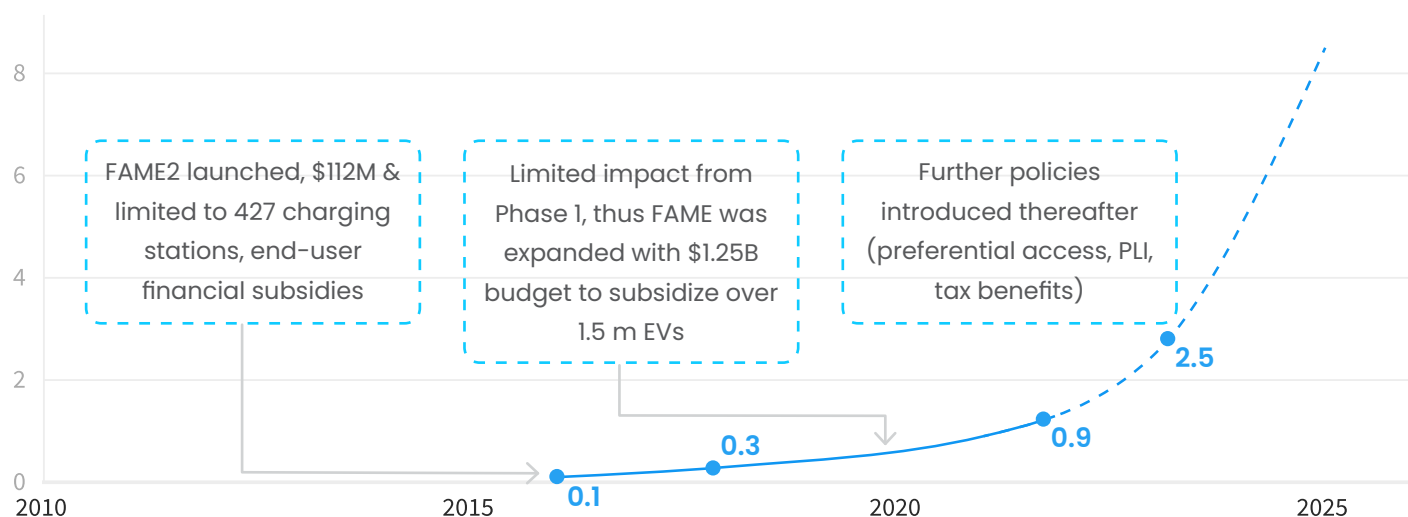
Max speed: 95 km/h
Range: 128 km/battery



TVS Raider INR 90 k

Max speed: 99 km/h
Range: 650 km

E2W Penetration (%)

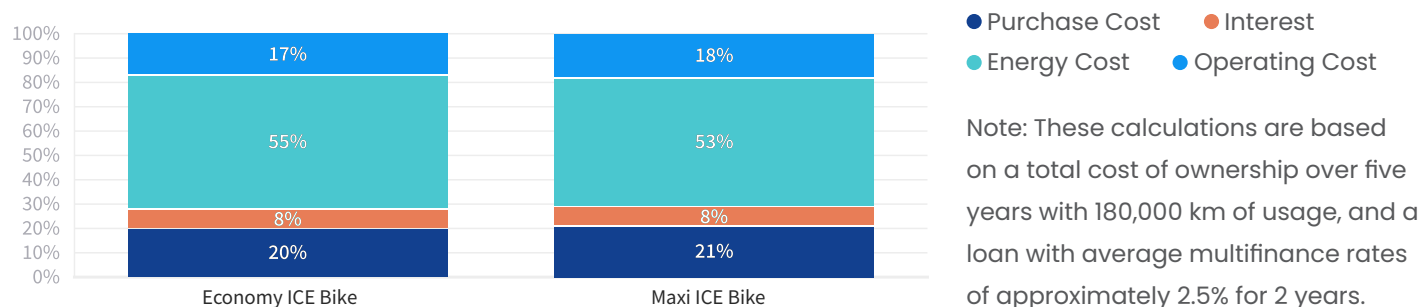


Key takeaways for Indonesia

Incentives for end-users required to catalyze the industry and bring e2W & ICE price parity closer

In Indonesia, getting a loan greatly affects whether people buy EVs

Buying vehicles generally accounts for about 10% of the total ownership cost



70% of Indonesians purchase both 2W and 4W vehicles through credit schemes

Sources: Toyota Auto Finance, Astra Honda Motor, KADIN Indonesia

The high cost of financing has been a major hurdle to EV adoption, but recent government involvement has helped to reduce the problem

- Traditionally, interest rates for ICE vehicles have been 21% per annum, and 29% per annum for EVs due to uncertainties in after-sales service and the used car market.
- However, recent incentives from corporations towards EVs, support from the Financial Services Authority (OJK), and the Himbara initiative's focus on EVs have improved the affordability of financing.
- A few finance companies have begun offering rates as low as 27% per annum (for one-year loans) despite the higher overall rates. This could potentially be less than some ICE vehicle financing rates, though further efforts are needed in implementing and promoting this strategy.

Note: As of H1 2023

Players in EV financing in Indonesia



BCA



BNI



Turno: a disruptor in Indian market that can be used as inspiration



Turno is an Indian electric vehicle platform that provides a range of financing choices to both individuals and companies.

EV financing has also become top of mind for the government, but needs more support to ensure improved total cost of ownership

New government support will help increase affordability

OJK Incentivizes Financial Services to Boost Electric Vehicle Industry

The Financial Services Authority (OJK) in a written statement asserted that it fully supports the government's program in accelerating the battery-based electric vehicles (KBLBB) industry by distributing multiple forms of incentives.

"We have issued incentives in the banking, capital market, and non-bank financial industry (IKNB) sectors to increase the role of the financial services industry in supporting the electric vehicle program," said OJK Public Relations Director Darmansyah in a written statement, November 30.

In the field of banking, the OJK provides incentives by relaxing the calculation of Risk Weighted Assets (RWA) by reducing the credit risk weight (ATMR) from 75 percent to 50 percent for electric vehicle production and consumption until December 31, 2023.

There will also be the provision of funds to debtors with the aim of purchasing electric vehicles and/or developing the upstream KBLBB industry—the battery industry, the charging station industry, and the component industry.

In the capital market sector, OJK provides a discount on green bond registration statement fees including battery-based electric vehicles funding to 25 percent of the original levy.

The Indonesia Stock Exchange (IDX) also responded to this by providing a discount on the green bond's annual listing fee rate of 50 percent of the listing fee rate. OJK also provides incentives and initiatives for finance companies by channeling funds to customers in the context of production and consumption.

Source: Tempo

Recommendations for a conducive EV ecosystem in Indonesia

Current pain points	Recommendations
Higher EV acquisition costs Implementation remains unclear from operator's side	For regulators: ● Gather feedback on current incentives and subsidies ● Evaluate the implementation strategy, including aspects such as who should receive support, the amount of support (considering the budget), eligibility criteria, and processes For EV players: ● Invest in sourcing expertise to have strong supply chain connections, ideally directly from principal supplier ● Identify ideal domestic to international production mix for TKDN compliance and cost efficiency ● Explore financing partnerships with different payment frequencies to meet the market's willingness to pay
Unfavorable EV lending & leasing schemes Financial institutions are less inclined to offer loans or leases to EV adopters, or they do so with terms and rates that are less favorable than those for ICE	For regulators: ● Mandate suitable battery warranties ● Ensure equal subsidy, tax, and preferential treatment for EV bikes with different business models such as battery swapping, charging, leasing, and more ● Co-develop and support risk-sharing facilities to limit lending risks to help financial institutions lease on better terms ● Continue promoting EVs as a key sector to banks, similar to the ongoing Himbara program. For EV players: ● Consider exploring warranties and buyback programs to enable financial institutions to reduce interest rates ● Partner with specialized financing companies with higher risk tolerance to build up credit viability

Sources: Team analysis, IFC

Recommendations for a conducive EV ecosystem in Indonesia

Current pain points	Recommendations
Unmet investment into EV • High capex with relatively uncertain outcomes • Strong requirements for local content but low supply	For regulators: • Encourage suitable phasing for localizing battery components, initially by relaxing import duties on certain crucial parts • Gradually increase local value addition • Establish comprehensive support and incentives for the supply side to boost local production and assembly industry For EV players: • Build robust plans that incorporate production phasing and investment risk distribution, including strategies like partnerships, staged funding rounds, and shared infrastructure plans • Pinpoint strategic investment opportunities and partnerships with both local and foreign entities
Limited public knowledge about EVs	For regulators: • Involve private sector companies in cooperative initiatives to broaden market outreach through campaigns, events, and public engagement • Develop strategies and rules requiring manufacturers to share information about the benefits of electric vehicles • Launch public awareness campaigns that promote the positive aspects of electric vehicles For EV players: • Provide public outreach programs that combine in-person demonstrations and online educational resources • Interact with local communities and enhance distribution channels through dealerships • Reinforce collaborations with the public sector and other compatible sectors such as utilities

Sources: Team analysis, IFC



Key Takeaways

Indonesia has a sizable market opportunity worth US\$20 billion in the EV industry.

To accelerate EV production and adoption, the country needs to maintain favorable policies, develop infrastructure, and support local producers in meeting the 40% local components requirement.

It is imperative for local investors to become actively involved in the market as soon as possible.

Additionally, partnerships between the government, state-owned enterprises (SOEs), and private businesses must be sustained to establish a robust ecosystem.

The development of leasing, financing, and SaaS should be prioritized to increase penetration.

A concerted effort to implement these measures can pave the way for a thriving EV market in Indonesia.

About AEML

AEML is a non-profit organization. We are the industry body, thought leader, and public policy advocate for the electric vehicle (EV) ecosystem in Indonesia. AEML engages, sustains, and grows the EV ecosystem through engagement with vehicle brand owners, component suppliers, battery providers, and infrastructure players.

Through these partnerships, we build collaboration among all stakeholders, creating economic and social value for Indonesia. Our mission of electrifying mobility in Indonesia is based on a calling to protect the environment by reducing pollution. AEML will achieve its vision of supporting the adoption of EVs and fostering the creation of a globally competitive EV ecosystem.

AEML Leadership:



Bp. Airlangga Hartarto

Chairman of the Board of Trustees



Bp. Dannif Utojo Danusaputro

General Chairman



Bp. M. Arsjad Rasjid P.M.

Chairman of the Supervisory Board



Bp. Rian Ernest Tanudjaja

Secretary General



Bp. Anugraha Dezmercoledi

Executive Director

About AC Ventures

AC Ventures (ACV) is a top Southeast Asian venture capital firm that invests in **early-stage startups focused** on Indonesia and ASEAN, with over US\$500 million in assets under management.

The firm's mission is to **empower entrepreneurs** with more than just capital by combining operational experience, industry knowledge, deep local networks, and resources.

ACV's team has invested in **over 120 tech companies** in the region since 2012. With a team of more than 35 professionals led by Adrian Li, Michael Soerijadji, Helen Wong, and Pandu Sjahrir, it has offices in Jakarta and Singapore.



Michael Soerijadji

Founder and Managing Partner



Adrian Li

Founder and Managing Partner



Helen Wong

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