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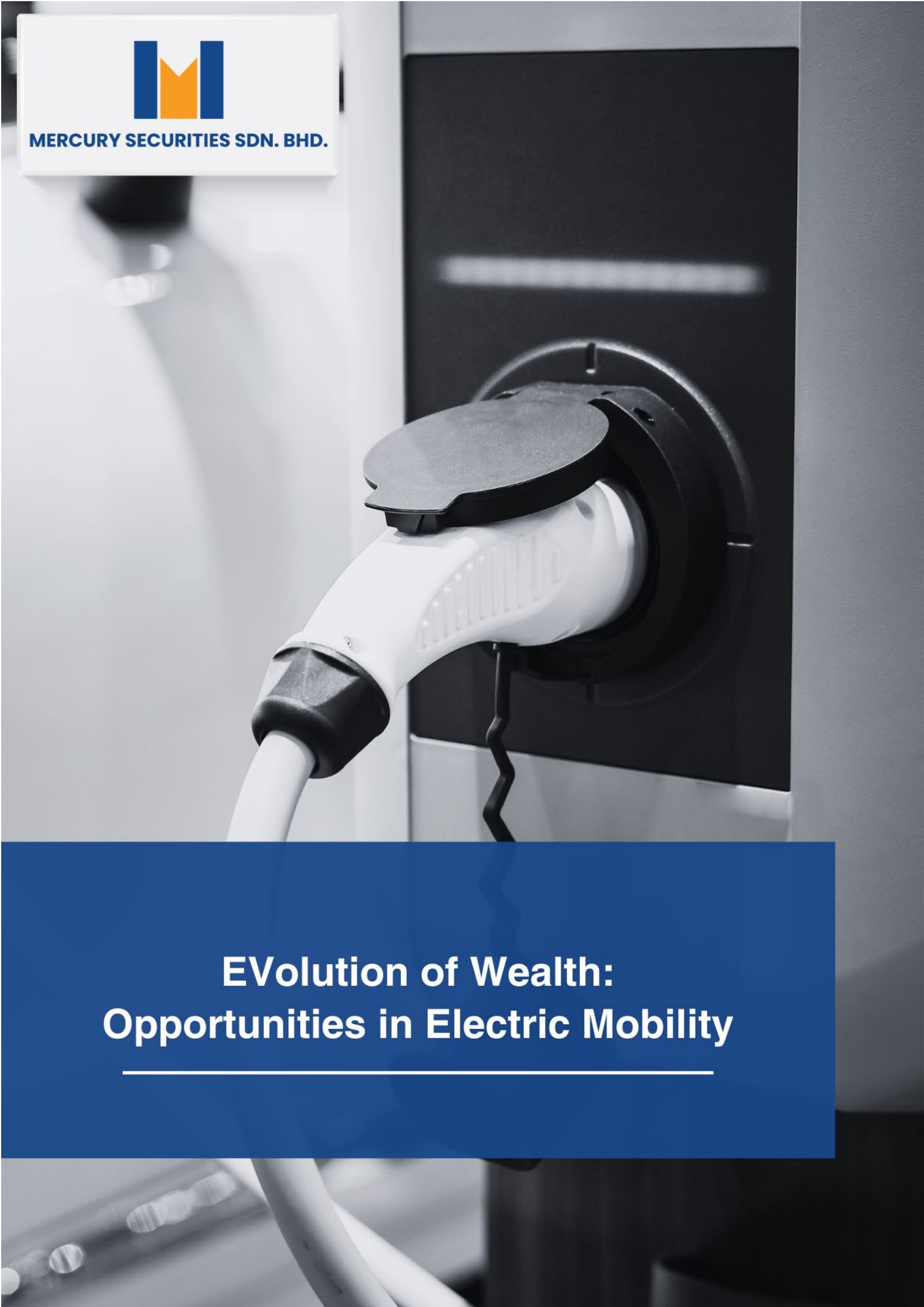

EVolution of Wealth: Opportunities in Electric Mobility

Foreword

The electrification of the automotive industry is propelling the world into a new era of transportation. The global shift towards electric vehicles (EVs) has gained momentum as we strive for environmental sustainability and reduced emissions.

This report series aims to illuminate the multifaceted benefits and evolving landscape of the electric vehicle industry. We will delve into the drivers behind the surge in EV adoption and uncover the promising investment opportunities that this burgeoning sector presents to investors.

Opportunities in Electric Mobility is the first in a series of reports assessing the EV market outlook in Malaysia. This initial report provides an overview of Malaysia's changing trade environment and how this has led to an increase in EV demand, as well as explores the EV value chain.

Subsequent reports in the series will be released weekly and provide additional analysis on various aspects of the market including the role of government and ecosystem players. The complete list of reports is as follows:

Title	Content
Investment Opportunities in Electric Mobility	This report delves into the evolving business prospects in the electric mobility sector, specifically exploring the impact of emerging low carbon regulations on Malaysias trade environment. It also discusses the increasing market interest in EVs and navigates the entire value chain.
Policies Powering the Shift	This report discusses the environmental advantages of EVs and emphasises the role of government policies and incentives in stimulating the transition to electric vehicle adoption.
Ecosystem Players	This report outlines the initiatives, services, and products introduced by industry players which are expected to drive growth and advancement in Malaysias EV sector.

Mercury Securities Research Team
January 2024

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Pivot or plummet: New regulations expected to alter Malaysia's trade landscape

Governments and institutions around the world are introducing new policies to help the transition to a low carbon economy. These policies will have a significant impact on Malaysias trade environment, and the country must choose to either innovate or stagnate.

Carbon Border Adjustment Mechanism (CBAM)

In 2022, the European Union (EU) introduced the CBAM, which imposes a trade tariff on imported goods based on the amount of carbon emission emitted in their production. It was designed to minimise the risk of carbon leakage in trade value chains, which occurs when companies move their production to countries with more lenient climate policies in an effort to save costs.

The mechanism works by requiring importers of certain goods to purchase CBAM certificates corresponding to the amount of carbon embedded in their products. The price of CBAM certificates is determined by the price of carbon in the EU Emissions Trading System. As a result, importers of goods from countries with less stringent climate policies will pay a higher price for their products.

The CBAM is expected to take effect in 2026, with a scope extending to products such as iron, steel, aluminium, fertiliser, electricity, and hydrogen. This current scope includes industries that are important to Malaysia, and it is estimated that 57% of Malaysia's total exports[1] will be affected by the implementation of the CBAM.

Malaysia's top export destinations are going green

A report by the Malaysian Investment Development Authority (MIDA) shows that more than 68% of Malaysia's exports go to Singapore, China, the USA, Japan, Hong Kong, Thailand, Republic of Korea, and Vietnam.[2]

These countries are actively introducing policies that put a price on carbon, and have geared up their efforts and resources to going green (see below).

Table 1: Malaysia's trading partners set ambitious green goals

	CHINA	UNITED STATES	JAPAN
Green economy investment programs 	Introduced National Green Development Fund (2022) worth 88 billion yuan (US$14 billion).	Introduced the Inflation Reduction Act (IRA) which provides $369 billion in financial support for clean technologies.	Introduced the Green Transformation (GX) initiative which commits to invest over 150 trillion yen ($1.1 trillion) over the next 10 years.

[1] National Energy Transition Roadmap, 2023
[2] Malaysia Investment Performance Report, 2021

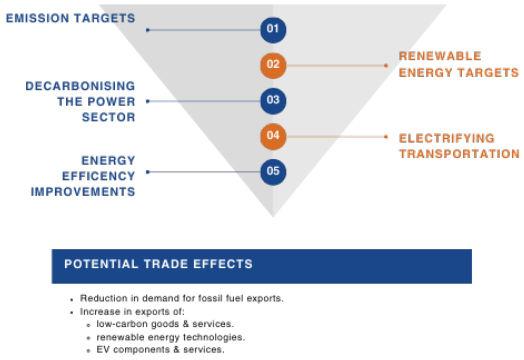
Emission targets 	Carbon neutrality by 2060.	Net zero emissions economy-wide by 2050.	Carbon neutrality by 2050.
Renewable energy (RE) targets 	14th Five-Year Plan (FYP): • Increase RE generation by 50% (from 2.2 trillion kWh in 2020 to 3.3 trillion kWh in 2025) • 50% of Chinas incremental electricity and energy consumption will come from renewables over the period between 2021-2025	Inflation Reduction Act (IRA): • 100% carbon pollution-free electricity by 2035	Green Transformation (GX): • 36-38% of renewable energy in the country's power mix by 2030 • Install 10GW of Offshore Wind Power and 104-118GW Solar Power by 2030 • Restart nuclear power for a 20-22% share in the national power mix by 2030.
Decarbonising the power sector 	Carbon emissions trading scheme: • 1st phase: 2021-2025 • Focuses on the power sector • Cap amount: 4.5 billion tonnes of carbon dioxide (CO2) equivalent per year • Compliance is mandatory for entities with annual emissions over 26 000 tCO2	Inflation Reduction Act (IRA): • Clean Energy Production and Investment Tax Credits • $27 billion for the Greenhouse Gas Reduction Fund • $40 billion in loan authority to guarantee loans for innovative clean energy projects	Green Transformation (GX): • Create successful ammonia/hydrogen co-firing cases by 2024, launch the supply chain in 2025, and attain cost reductions by 2030. • Build CCUS value chain and capture 120-240 million tonnes of CO2 by 2050

Electrifying transportation
 
	Unveiled a 520-billion-yuan ($72.3 billion) package of tax breaks over four years for EVs in June 2023.	Inflation Reduction Act (IRA):
		• Clean Vehicle Credit (max. $7,500)
		• Previously-Owned Clean Vehicles Credit (max. $4,000)
		• Commercial Clean Vehicles Credit
		• $1 billion for the Clean Heavy-Duty Vehicle Program
		• 3 programs to grow the domestic supply chain for clean vehicles
		  ○ $3 billion to the Department of
			Green Growth Strategy:
			• Tax credit of up to 10% or a special depreciation of 50% for:
			  ○ Lithium-ion storage batteries for EVs or PHEVs
			  ○ Stationary lithium-ion storage batteries
			  ○ Fuel cells
			• Install 150,000 units of charging infrastructure
			• R&D

		- Energy's Advanced Technology Vehicle Manufacturing Loan Program - provides $2 billion to the Department of Energy for Domestic Manufacturing Conversion Grants - Advanced Manufacturing Production Credit	
Energy efficiency improvements 	14th Five-Year Plan (FYP): • Aims to reduce energy intensity by 13.5% between 2021-2025	Inflation Reduction Act (IRA): • $1 billion for the Green and Resilient Retrofit Program • $1 billion for Department of Energy grants to state and local governments to adopt updated building energy codes • Extension and expansion of the energy efficient commercial buildings deduction • $9 billion for states and Tribes for consumer home energy rebate programs • The Energy Efficiency Home Improvement Credit provides up to $3,200 annually in tax credits to lower the cost of energy efficient upgrades by up to 30 percent • The Residential Clean Energy Credit provides a 30 percent tax credit to lower the installation cost of residential clean energy • The New Energy Efficient Home Credit provides up to $5,000 in tax credits for each new energy-efficient home and up to $1,000 for each unit in a multi-family building	Green Transformation (GX): • New houses and buildings to achieve zero emissions by 2030 • Promoting LCCM (Life Cycle Carbon Minus) and ZEH/ZEB (net-zero energy houses/ buildings) to absorb 5.6 million tonnes of CO2 by 2030

How Malaysia's trade landscape will be reshaped

Figure 1: How Malaysias trade landscape will be reshaped



The ambitious emission reduction targets introduced by China, the United States, and Japan, compounded by the countries' efforts to decarbonise the power sector, are likely to reduce the global demand for fossil fuels.

Petroleum gas was Malaysia's main export product to Japan in 2021, representing 22.3% ($4.23bn) of total exports.[3] At the same time, petroleum gas also represented 6.8% ($3.27bn) of total exports to China in the same year[4]. Malaysia's trade landscape will likely alter as these countries transition to a low-carbon economy and consume less fossil fuel.

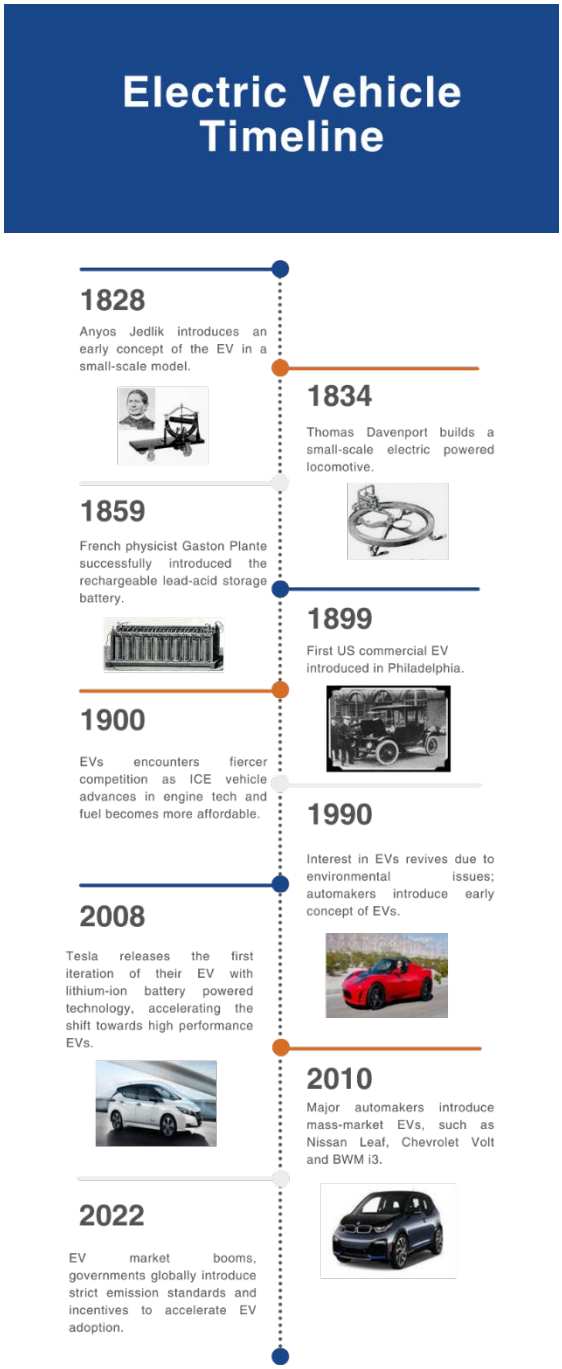
At the same time, the ambitious renewable energy targets announced by these countries are likely to increase demand for renewable energy technologies, such as solar panels and wind turbines, which would consequently boost Malaysia's export potential for these products.

Lastly, countries globally are also shifting their focus on electrifying transportation in a bid to reduce greenhouse gas (GHG) emissions from the transportation sector. For the rest of this report, we will focus on how the Malaysian economy can benefit from this shift.

[3] OEC, 2021
[4] OEC, 2021

The evolution of EVs

Figure 2: The EV timeline



Early concepts of EV (1828-1834)

Electric vehicles originated in 1828 when Hungarian innovator Anyos Jedlik created the worlds first electric motor for a small car, though its practicality was limited. In 1832, Anderson, regarded as the father of the electric car, built the first basic electric carriage powered by non-rechargeable cells. Expanding on this in 1834, American blacksmith Thomas Davenport introduced an electric locomotive with an electrified train track, marking a new era of progress for electric vehicles.

Advancement in EV models (1859-1888)

However, early electric vehicle progress faced challenges as the models required a constant power grid connection. A turning point came with French physicist Gaston Plantes breakthrough introduction of the rechargeable lead-acid storage battery in 1859. In 1888, inventor Andreas Flocken unveiled the Flocken Elektrowagen, considered one of the earliest electric cars.

Early commercial usage of EVs (1899-1900)

In 1899, the first United States commercial electric vehicle was introduced in Philadelphia. It was not until in the early 20th century in cities that electric car became more popular, with commercial users being taxi drivers in the US and Britain. In the 1900s, electric cars accounted for one-third of vehicles in the United States because they were quiet and emitted no fumes.

Competition with ICE cars (1900-1910)

Yet, electric cars encountered heightened competition as combustion engine vehicles gained popularity due to technological advancements in car engines. In 1908, Henry Ford transformed the automobile industry with a production line system, reducing the final price of cars to half that of EV. Simultaneously, the global discovery of oil reserves made

gasoline more affordable. Consequently, internal combustion engine vehicles surged in popularity, leading to a temporary decline in the EV industry.

Revival of interest in EV (1970-1990)

Interest in EVs experienced a revival after World War II, driven by fuel shortages at the time. However, it was the oil crises in the 1970s that heightened awareness due to the energy sectors over-reliance on oil and rising prices. In the early 1990s, California spearheaded a mandate for more fuel-efficient, lower-emission vehicles by 2003. Despite this push, only a few automakers succeeded in developing a cost-effective EV. General Motors, with the introduction of the EV-1, cited the model as too expensive and unprofitable.

Tesla and the EV Renaissance (2008-2010)

In 2008, Tesla revolutionised the electric vehicle (EV) landscape with the Roadster, the first EV boasting a 300+ kilometer range powered by lithium-ion batteries, influencing contemporary EV designs. From 2008 to 2010, the EV industry experienced substantial growth due to advancements in battery technology driven by a shared commitment to emission reduction. Global automakers began to expand their production line to include EVs with the introduction of Nissan Leaf, Chevrolet Volt, BMW i3 and Mitsubishi i-MiEV.

Stricter emission standards and EV market boom (2010-Current)

Post-2008, global governments began introducing stricter emission standards such as the Euro 6 standards, the China 6, and India's Bharat Stage emission standard. Following that, many incentives were introduced by governments around the world to hasten EV adoptions such as tax credits and funding for development of EV charging infrastructure.

Today, we are witnessing a boom in the EV market as electric vehicle sales make up 18% of global vehicle sales.[5] According to Statista, it is expected that the EV market will grow at a CAGR of 9.82% from 2024-2028.[6]

Demand for EVs powers up

The introduction of new EV-friendly policies, both international and domestic, has resulted in a rise of EV adoption across the world, and this trend is poised to reshape the automotive landscape

Malaysia's EV adoption set to expand rapidly despite modest penetration rate

Demand for EVs in Malaysia is expected to far outstrip that of ICEVs in the coming years. This trend is driven by government incentives, the presence of local EV manufacturing lines, and the entry of new automakers into the market.[7]

[5] Clean Technica, 2023
[6] Statista
[7] BMI, 2023

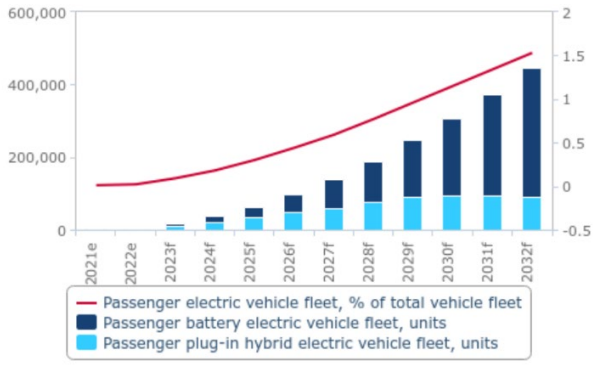
Malaysian EV sales surged by 870.8% in 2022, albeit from a low base. Total EV unit sales are also expected to quadruple in 2023, although the country's EV penetration rate[8] is forecasted to sit at just 1.8%. Even though Malaysia's EV adoption rate is lower than other countries, the data suggests that there is a lot of room for growth in the market.

Table 2: Passenger EV Market - Historical Data and Forecasts (Malaysia 2021-2032)

INDICATOR	2021	2022	2023F	2024F	2025F	2026F	2027F	2028F	2029F	2030F	2031F	2032F
Total EV sales (units)	271	2,631	13,349	20,224	26,830	34,577	41,990	49,479	57,056	64,637	79,396	94,113
Total EV sales (% y-o-y)	41.1	870.8	407.4	51.5	32.7	28.9	21.4	17.8	15.3	13.3	22.8	18.5
BEV sales (units)	81	868	4,539	9,101	14,757	20,746	29,393	34,635	42,792	58,173	71,456	84,702
BEV sales (% y-o-y)	113.2	971.6	422.9	100.5	62.1	40.6	41.7	17.8	23.6	35.9	22.8	18.5
PHEV sales (units)	190	1,763	8,810	11,123	12,074	13,831	12,597	14,844	14,264	6,464	7,940	9,411
PHEV sales (% y-o-y)	23.4	827.9	399.7	26.3	8.5	14.6	-8.9	17.8	-3.9	-54.7	22.8	18.5

Source: BMI

Figure 3: EV fleet by type & EV fleet penetration



e/f = BMI estimate/forecast. Source: Local sources, BMI.

Source: BMI

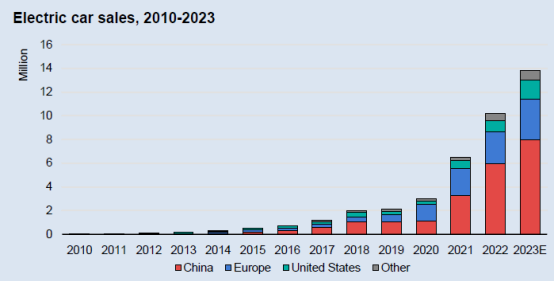
[8] EV sales as % of total vehicle sales

Global demand is also ramping up

EV adoption is a global phenomenon, with revving demand led by China, Europe, and the US.

Global electric car sales increased by more than half in 2022, reaching over 10 million units. China accounted for most of this growth, with sales increasing by 80% from the previous year. The United States and Europe also saw strong growth, with sales rising by 55% and 15%, respectively.[9]

Figure 4: Global electric car sales (2010 - 2023)



Source: IEA

China

In 2022, EV sales in China continued to grow rapidly, even as overall car sales experienced a marginal decline of 3%. Battery electric vehicle (BEV) sales increased by 60% to 4.4 million units, while plug-in hybrid electric vehicles (PHEV) sales nearly tripled to 1.5 million units. China accounted for almost 60% of all new electric car registrations worldwide.

US

Electric car sales in the US increased by more than half (55%) in 2022, even against the backdrop of overall car sales decline. BEVs led the growth, with sales increasing by 70%. PHEV sales also increased, but at a slower rate of 15%. This growth is impressive considering that total car sales in the US fell by 8% in the same year. The US accounted for 10% of the global growth in electric car sales in 2022.

Europe

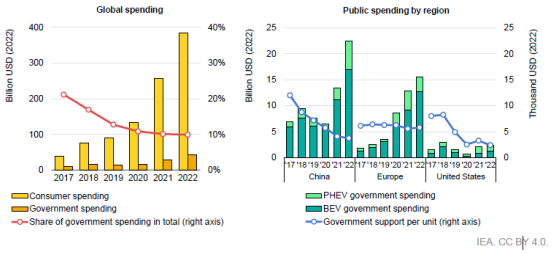
Europe is now the worlds second largest market for electric cars after China, accounting for 25% of all electric car sales and 30% of the global stock. Electric car sales in Europe grew by more than 15% in 2022, even as the overall car sales in the region declined by 3%. As a result, Europe accounted for 10% of the global growth in new electric car sales in 2022.

Growing EV demand fuels hefty investments from auto giants

To further illustrate the rising demand for EVs, global spending on electric cars surged by 50% in 2022, reaching USD 425 billion. Consumers accounted for most of this spending, while governments contributed USD 40 billion (~10% of total spending) through purchase incentives. The growth in EV spending is helping carmakers generate more revenue from EV sales, particularly from SUVs and large car models.

[9] IEA, 2023

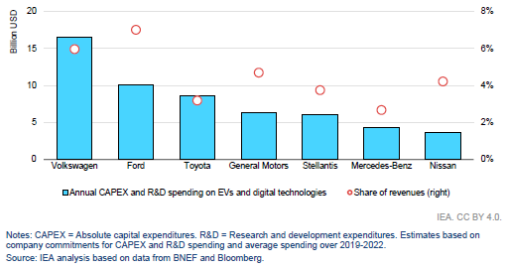
Figure 5: Global consumer and government spending (2017-2022)



Source: IEA

To respond to this growing demand, the world's largest automakers[10] ramped up their annual spending commitments on EVs and digital technologies to more than USD 55 billion between 2019-2022, accounting for 50%-70% of their total CAPEX and R&D spendings.

Figure 6: Annual CAPEX and R&D spending commitments on EVs and digital technologies (2019-2022)



Source: IEA

Seeing the combined efforts displayed by the public and private sector in promoting EV adoption, it becomes clear that the rise in EV usage is an enduring trend that shows no signs of diminishing soon.

[10] These seven automakers (Volkswagen, Ford, Toyota, General Motors, Stellantis, Mercedes-Benz, Nissan) were collectively responsible for nearly half of light-duty vehicle (LDV) sales in 2022.

Beyond sustainability: Why people love EVs

The public's fascination with EVs extends far beyond their sustainability. Understanding the multifaceted reasons why people are drawn to EVs unveils a tapestry of motivations beyond environmental concerns.

This section delves into the diverse aspects that contribute to the love for EVs, which spans from their performance and driving experience to technological advancement and cost-effectiveness.

Technological innovation

Recent research featured in Proceedings of the National Academy of Sciences journal reveals that the widespread adoption of EVs is primarily propelled by technological advancements, even as general consumer preferences for EVs have remained relatively stable.

Enhancements such as extended battery range, faster charging, and declining prices have positioned EVs as appealing alternatives to traditional gasoline-powered cars. Notably, the study emphasises the significance of range, indicating that vehicles capable of traveling 300 miles or more on a single charge are perceived as equally attractive as comparable gas cars by consumers.

Over the past decade, the EV landscape has witnessed rapid technological progress, including a 15% increase in average efficiency and a 200% rise in average range. The market availability of EV models has also expanded significantly, accompanied by a decline in the price premium over time.

Projections suggest that if technology trends persist and EVs become as prevalent as gasoline vehicles by 2030,

buyers of cars and SUVs will exhibit near-indifference between the two, on average.[11]

Lower operating costs

Fuel costs

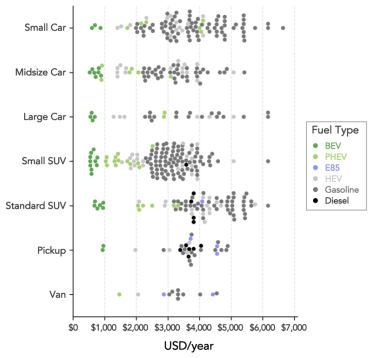
Projections of annual fuel expenses for light-duty vehicles in the model year 2022 show substantial savings for consumers that opt for EVs in comparison to gasoline or diesel counterparts.

All EV models incur annual fuel costs below $1,000, except for plug-in hybrid electric (PHEV) and hybrid electric (HEV) models that fall within the $1,000 to $2,000 range.

Meanwhile, conventional gasoline models dominate the $2,000 to $7,000 range. The variability in fuel costs within the small car category is notable, encompassing both fuel-efficient compact cars and high-end sports cars with lower fuel efficiency.

Each data point represents the base model and reflects the average cost across all certified configurations of that specific model.

Figure 7: Annual fuel costs of light-duty vehicles for model year 2022



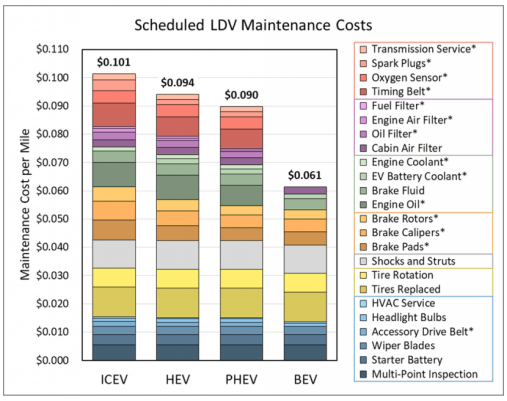
Source: U.S. Department of Energy

Maintenance costs

The projected cost for routine maintenance of a light-duty BEV is 6.1 cents per mile, whereas a traditional ICEV incurs a higher cost of 10.1 cents per mile. Unlike an ICEV, a BEV does not have components such as an engine oil system, timing belt, oxygen sensor, and spark plugs, all of which contribute to the lower maintenance costs.

Meanwhile, HEVs and PHEVs share some maintenance expenses with both ICEVs and BEVs, but benefit from cost savings in brake maintenance.

Figure 8: Light-duty vehicles maintenance costs



Source: U.S. Department of Energy

Instant torque, smoother performance

In an EV, instant torque is produced through the interaction of an electric current and magnetic fields within the electric motor. In contrast, a gasoline vehicle requires a lengthier process of gas combustion and crankshaft rotation.

Additionally, EVs commonly have a lower centre of mass and well-distributed weight due to their unique chassis design. The chassis, or the foundational frame of the vehicle, houses a battery pack that spans

[11] Forsythe, C., Gillingham, K., Michalek, J. J., & Whitefoot, K. S. (2023). Technology advancement is driving electric vehicle adoption. *Proceedings of the National Academy of Sciences of the United States of America*, *120*(23). https://doi.org/10.1073/pnas.2219396120

the underside. A substantial component of the EV, the battery pack replaces the bulky gas engine with a lighter electric motor. The concentration of weight near the ground enhances the vehicles road adherence and facilitates adept manoeuvring through curves and bends. [12]

Reduced noise

Urban areas typically have an average background noise level of 60 decibels, with occasional peaks reaching 85 decibels or more.

EVs, including Battery Electric Buses (BEBs) and Electric Shuttle Buses (ESBs), generate minimal noise, especially in urban and residential settings where engine noise is the predominant source of noise pollution. Therefore, unlike ICEVs, EVs contribute to reducing general noise pollution, providing community-wide advantages and potential stress reduction for drivers. [13]

From mineral mines to showrooms: Navigating the EV value chain

The value chain of an EV ranges from the mining of raw materials to the manufacturing and assembly of the vehicles themselves. EV batteries account for 40% of the manufacturing cost of a single EV, making them the most valuable components in the overall supply chain.

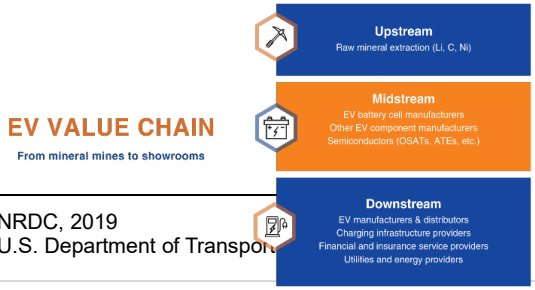


Figure 9: Overview of the EV supply chain

Source: IEA

Upstream: Raw mineral extraction

The most commonly used EV batteries are lithium-ion batteries which are manufactured out of critical minerals such as lithium, nickel, graphite, cobalt, and manganese.

According to S&P Global, the production of battery metal is poised to almost triple by 2025 to more than 1.5 million metric tonnes[14], driven by a burgeoning demand sparked by the worlds increasing commitment to green policy initiatives.

Table 3: Countries producing minerals used to create EV batteries

Mineral	Countries
Lithium	Australia, Chile, China, and Argentina.
Nickel	Indonesia, Philippines, New Caledonia, Russia, and Australia.
Cobalt	Democratic Republic of Congo (DRC), Russia and Australia.
Manganese	China, South Africa, Australia, Gabon, and Brazil.
Graphite	China, Mozambique, Madagascar, Brazil.

Source: Mineral Commodities Summary 2023, US Geological Survey

Most of the rare earth minerals used in manufacturing EV batteries are produced all over the world, but majority are mined and processed in China.

In fact, China processes more than half the worlds lithium, two-thirds of its cobalt, more than 70% of its graphite, and about one-third of its nickel.[15] **Malaysia does**

[12] NRDC, 2019
[13] U.S. Department of Transport
[14] Source: S&P Global
[15] Source: IEA

not have any discernible presence in the critical mineral extraction process within the EV value chain.

Midstream: Manufacturing components used in EV

The midstream segment of EV manufacturing is where the key components that power these vehicles come together. Since EV batteries are costly to manufacture, the majority of OEM EV companies (e.g., Tesla, BYD) have in-house specialisation in manufacturing cost-effective and long-lasting electric batteries. We can categorise the manufacturing segment into battery packs and other systems.

Battery Packs

China dominates the key components of EV battery manufacturing, holding a significant share in cathodes (70%), anodes (80%), and electrolytes (50%). These components are essential for lithium-ion battery production, with over 75% of these batteries made in China.

Meanwhile, Malaysia is known for hosting factories and facilities for EV battery production, with a few Malaysian companies involved in the EV batteries manufacturing supply chain.

Table 4: Malaysian stocks involved in EV battery pack manufacturing

Companies	
Greatech (0208)	• Greatech manufactures equipment that are used to automate processes in production lines. The products are used in the manufacturing of solar modules, semiconductors, and consumer electronics. • In 2022, the company expanded their presence in North America by securing numerous new orders to create and install battery assembly systems for American EV makers.
Genetec (0104)	• Genetec provides factory automation solutions (FAS) primarily in the E-Mobility and Energy Storage segments, which account for 86.7% of its total revenue in 2023. • 78% of Genetec's product exports are to the EU and US. • Recent JV with Citaglobal introduced Malaysia's first locally-developed and produced Battery Energy Storage System (BESS).

Source: Annual reports, company statements

Other components

Electric motors, power electronics, and charging systems are integral components in an EV. While they may not be as costly as EV batteries, the increasing demand for EVs is expected to benefit companies specialising in these components.

In the EV supply chain, semiconductor companies in Malaysia play a crucial role, providing critical components like power electronics and advanced control systems. As the demand for EVs rises, these semiconductor companies stand to benefit from their pivotal role in driving technological advancements within the growing EV industry.

Table 5: Malaysian stocks involved in other EV components manufacturing

Companies	
MPI (3867)	• MPI's CARSEM provides assembly and packaging services for silicon carbide (SiC) products, a key component in power management applications for EV for major customers in Europe and China. • Automotive sector represents their highest revenue segment at 43% in FY23.
Pentamaster (7160)	• Pentamaster manufactures testers for semiconductors that are crucial for checking chips, sensors, and power components in electronics, cars, and medical devices. • Half of the orders for these testers come from the EV segment, which is expected to account for around 40% of the group's revenue in FY23.
D&O Green Technology (7204)	• D&O develops smart LEDs for the EV industry. • Dominant Opto Technologies, a subsidiary of D&O was in the top 5 global automotive LED suppliers in 2020 and recorded highest annual revenue growth among its peers in the same year. • D&O's previous customers include Tesla, BMW, KIA, Ford, Geely, and Leapmotor.

Source: Annual reports, company statements

Downstream: EV manufacturing, infrastructure, and support services

Manufacturer & distributor of EVs

This aspect of the downstream sector involves the production and assembly of EVs, including their components like batteries and motors. As the demand for EVs grows, manufacturers invest in advanced facilities. Distributors play a crucial role in transporting EVs to dealerships and customers, connecting manufacturers to end-users.

Table 6: Malaysian stocks involved in the manufacturing and distribution of EVs

Companies	
Sime Darby	• Sime Darby's largest revenue contributor is its motor segment, spanning coverage across 10 markets in Asia Pacific while representing more than 30 automotive brands including China's EV giant BYD. • Sime Darby's recent acquisition of UMW is expected to boost their capacity to become the main player in the global production hub and supply chain of EVs in Southeast Asia.
Bermaz Auto	• Bermaz Auto engages in distribution of Mazda, Kia and Peugeot vehicles in Malaysia and the Philippines. • Mazda plans to introduce 13 EV model cars from 2022-2025. • Bermaz Auto is reportedly looking to expand into the EV segment with the addition of a Chinese EV brand to its portfolio.
EPMB	• EP Manufacturing Bhd (EPMB) manufactures and distributes two-wheeled EVs for Malaysian and other Southeast Asian markets. • EPMB signed an agreement with Sharkgulf Technologies in 2022 to manufacture, market, and distribute their electric 2-wheel EVs. • EPMB also signed an agreement with Lingbox for their Micro EV passenger car.
Artroniq	• Artroniq operates in the Information and Communications Technology (ICT) sector, focusing on innovative services and products. • In 2023, Artroniq entered an MOU with Beno Inc. to provide assembly services to

	complete the production of the Reevo e-Bikes. • In 2023, Artroniq also entered into a Distribution Agreement with PT. Terang Dunia Internusa (through its subsidiary, United E-Motor) for the distribution and assembly rights of their electric motor products.

Source: Annual reports, company websites, company statements

Installation of EV charging infrastructure

The installation of charging infrastructure is essential for the widespread adoption of EVs. Companies in this space work on establishing a variety of charging solutions in Malaysia by focusing on the development and deployment of charging stations and networks.

As of September 2023, Malaysia currently has slightly over 1,000 public charging stations, with the government aiming to have more than 10,000 charging stations in place by 2025 according to the Low Carbon Mobility Blueprint (LCMB) 2021-2030. The following are companies that are expected to benefit from this plan:

Table 7: Malaysian stocks involved in the installation of EV charging infrastructure

Companies	
Tenaga Nasional Berhad	• TNB is the largest electric utility company in Malaysia. The company is involved in the generation, transmission, distribution, and sale of electricity. • As part of the TNB Energy Transition Plan, the company aims to make provisions for 3,300 charging points across the country by 2025. • TNB will be investing RM22 million in 2023 and RM90 million in the span of 3 years (2022-2024) to uplift the development of the EV ecosystem in Malaysia
Yinson	• Yinson shifted its focus to the electrification megatrend, allocating more resources to its business units: chargEV (EV charging stations), rydeEV (electric bikes and scooters), drivEV (EV leasing), marinEV (marine electrification). • YGT (Yinson's subsidiary) partners with Gentari and EV Connection to enhance its EV charging network, making stations from all three providers accessible to members via a mobile app.

Source: Annual report, company website

Financial and insurance services for EV

Financial and insurance services specific to EVs have emerged thanks to the growing market. Financial institutions and insurance companies are adapting to the changing automotive landscape by providing specialised services for the EV market, including offering financing and leasing options tailored to EV ownership, as well as insurance policies designed to meet the unique needs of EV drivers.

Table 8: Malaysian stocks providing financial and insurance services for EVs

Companies	
Public Bank	• Public Bank Bhd is a Malaysian banking group with presence in countries such as Hong Kong, China, Cambodia, Vietnam, Laos and Sri Lanka. • Public Bank Group introduced Energy Efficient Vehicles Financing, a promotion for

	financing energy-efficient vehicles (EEVs), providing more than RM30 billion in loans for EEVs in Malaysia in 2022, accounting for over half of its total hire purchase financing portfolio.
Maybank	• Malayan Banking Bhd has a strong regional presence in Southeast Asia. • In 2022, Maybank Group introduced preferential rates for the financing of electric and hybrid vehicles, which contributed to the mobilisation of RM302.23 million, an increase of more than 550% in hybrid vehicle financing from 2021.

Source: Annual reports, sustainability report

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L-7-2, No 2, Jalan Solaris, Solaris Mont Kiara, 50480 Kuala Lumpur

Telephone: (603) - 6203 7227

Website: www.mercurysecurities.com.my

Email: mercurykl@mersec.com.my