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Evolution of Wealth: Policies Powering the Shift

Foreword

The electrification of the automotive industry is propelling us 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.

Policies Powering the Shift is the second in a series of reports assessing the EV market outlook in Malaysia. This report examines the environmental benefits of EVs and underscores the impact of government policies and incentives in promoting the shift toward the adoption of electric vehicles.

Subsequent reports in the series will be released weekly and provide additional analysis on the contributions of various ecosystem players to Malaysia's EV sector. 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.

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EV adoption slashes carbon footprints

EVs come in various configurations, and the key distinction often lies in the number of wheels. 4-wheel EVs (4WEVs) are the most common types of electric vehicles and include cars, SUVs, trucks, and other larger vehicles. 4WEVs generally have electric motors powering all four wheels, providing stability, traction, and the ability to carry passengers and cargo. Examples include:



Tesla Model Y



Peugeot e-2008



Nissan Leaf

Meanwhile, 2-wheel EVs (2WEVs) have two wheels (e.g., motorcycles or scooters), and

are generally more suitable for urban commuting as they are smaller and more easily manoeuvrable than 4-wheel EVs. Examples include:



Kawasaki Z e-1



Yadea G5S



Blueshark R1

The last category is electric public transport vehicles, which includes electric buses and electric trains. Electric buses are becoming increasingly popular in urban areas as cities aim to reduce emissions from public transportation. Meanwhile, electric trains are already in use in many parts of the world as

the electrification of rail transport continues to be an environmentally friendly option.

A noteworthy undertaking in this context is the initiative put forth by Prasarana Malaysia Bhd, which suggested acquiring 150 electric buses and building three bus depots, at an approximate investment cost of RM600 million. This effort is aimed at bolstering the Light Rail Transit (LRT) 3 project.

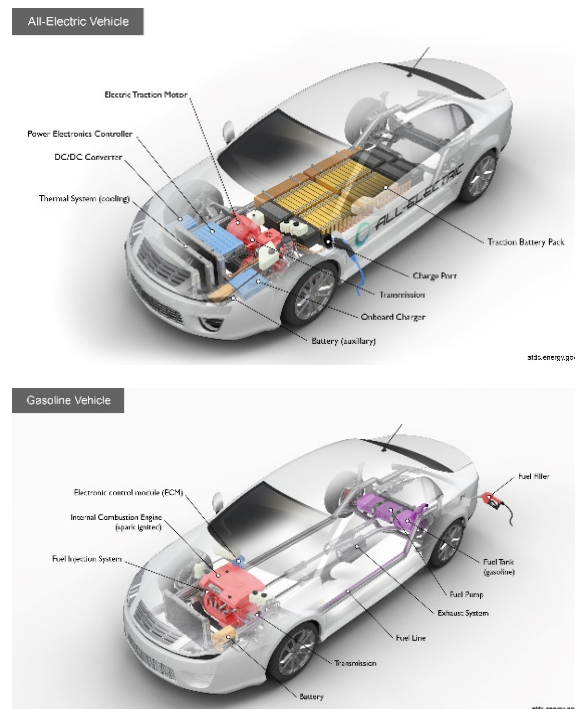
To understand why governments are investing in electric vehicles (EVs) and why the EV trend is here to stay, it is essential to grasp the importance of electrifying transportation for a low-carbon economy.

But first, let us look at what constitutes an EV.

What is an EV?

In this report section, our primary focus is on electric cars, although as previously mentioned, EVs can encompass a wide range of vehicles, including motorcycles, public transportation, and more.

Figure 1: Comparison between an EV and an ICE



Source: US Department of Energy

The primary difference between a fully-electric car and an Internal Combustion Engine (ICE) car lies in their power source. EV cars are powered by electricity stored in the battery, while ICE cars (or gasoline cars) utilise spark-ignited internal combustion engines, where petrol is mixed with air and ignited by a spark.

There are four main types of EVs: battery electric vehicles (BEVs), plug-in hybrid electric vehicles (PHEVs), hybrid electric vehicles (HEVs), and fuel cell electric vehicles (FCEVs). The first three EV types use electricity to improve fuel efficiency, but some of them also use liquid fuels.

Meanwhile, FCEVs are powered by hydrogen and are the most efficient type of EV as they produce no harmful emissions, but the hydrogen infrastructure to fuel them is still in development.

Table 1: Types of EVs

Type	Power source	Driving range	Refueling options	Unique features
All-electric vehicle (BEV)	Battery	Shorter	Electric charging	Zero-emission tailpipe
Plug-in hybrid electric vehicle (PHEV)	Battery and gasoline	Moderate	Electric charging and gasoline engine	Can drive moderate distances using just electricity
Hybrid electric vehicle (HEV)	Gasoline and electric motor	Longer	Gasoline engine	Cannot drive using electricity alone
Fuel cell electric vehicle (FCEV)	Hydrogen	More than 300 miles	Hydrogen fueling	Zero-emission tailpipe, fast refueling

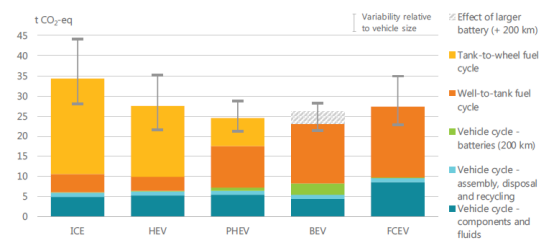
Source: US Department of Energy

EVs emit lower GHG emissions across the value chain

According to a report by the International Energy Agency (IEA)¹, the well-to-wheel GHG emissions² of an EV depends on:

- how much energy they use; and
- how much carbon is produced in generating the electricity that powers them

Figure 2: Emissions comparison of a mid-size global average car by powertrain over its lifetime



IEA 2019. All rights reserved.
Notes: This figure portrays mid-size vehicles having similar performance with the exception of driving range. The BEV refers to a vehicle with 200 km range, the addition of the shaded area refers to a vehicle with 400 km range. The ranges suggested by the sensitivity bars represent the case of small cars (lower bound) and of large cars (upper bound) – for BEVs, the lower bound of the sensitivity bar represents a small car with a 200 km range, and the upper bound represents a large car with a 400 km range. The carbon intensity of the electricity mix is assumed equal to the global average (518 g CO₂/kWh). FCEVs are assumed to rely entirely on hydrogen produced from steam methane reforming. Other assumptions used to develop this figure are outlined in the Chapter 4 of the Global EV Outlook 2019, focused on life-cycle GHG emissions.

Source: IEA

If we consider the impact of current global policy settings, EVs are projected to reduce well-to-wheel GHG emissions by 50% compared to an equivalent fleet of ICE vehicles. This will offset 220 million tonnes of carbon dioxide equivalent (Mt CO₂-eq) from the atmosphere.

However, the most effective way to reduce GHG emissions from EVs is to decarbonise the power generation systems. Assuming a scenario of rapid decarbonisation of the power sector coupled with an accelerated deployment of EVs, the EV fleet would offset up to 540 Mt CO₂-eq from the atmosphere – a substantially higher figure.

Government policies are powering the shift to green energy

The National Energy Transition Roadmap (NETR) was launched in August 2023 and establishes a clear trajectory for the national energy mix, greenhouse gas (GHG) emission reductions, and energy transition initiatives.

The NETR's Responsible Transition (RT) aims to generate investment opportunities between RM1.2 trillion to RM 1.3 trillion, uplift GDP value from RM25 billion in 2023 to RM220 billion, and create 310,000 jobs by 2050. This roadmap outlines 50 initiatives under 6 energy transition levers, 5 enablers, and 10 flagship projects.³

Green mobility lever

For the purposes of this report, we will only be focusing on the Green Mobility lever as it pertains to EVs. The goals for this lever are as follows:

Figure 3: Green Mobility lever goals

ENERGY TRANSITION LEVER		
Green Mobility		
2030	2040	2050
<ul style="list-style-type: none"> • 20% of 4W fleet as xEVs • 20% of 2W fleet electrified 	<ul style="list-style-type: none"> • 50% of 4W fleet as xEVs • 50% of 2W fleet electrified 	<ul style="list-style-type: none"> • 80% of 4W fleet as xEVs • 80% of 2W fleet electrified

Land transport (light vehicle) initiatives

¹ IEA, 2019

² Well-to-wheel GHG emissions refer to the total GHG emissions associated with the full life cycle of a vehicle - from the extraction of the raw materials to the combustion of the fuel in the engine.

³ National Energy Transition Roadmap (NETR), 2023

Land transport falls under the purview of the Green Mobility lever. Land transportation significantly contributes to Malaysia's GHG emissions, representing 55 MtCO₂eq and 85% of the overall transportation emissions.

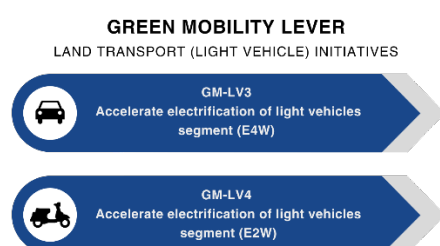
However, the transition to green mobility in land transport encountered several challenges, including insufficient public transportation infrastructure and connectivity, a gradual acceptance of eco-friendly public transit, and the requirement to adhere to the ASEAN fuel economy regulations.

By recognising these challenges, the NETR emphasises a strategic focus on three key areas:

- transport modal shift
- fuel economy improvements; and
- electrification initiatives

There are 2 key initiatives pertaining to transport electrification as explained below:

Figure 4: NETR land transport (light vehicle) initiatives relevant to the EV industry



Source: NETR 2023

GM-LV3: Accelerate electrification of light vehicles segment (E4W)

⁴ Electric four-wheelers

⁵ Local EV

⁶ Electric two-wheelers

This initiative focuses on accelerating the electrification of light vehicles in the E4W⁴ segment. By 2050, the NETR aims to accelerate the adoption E4Ws to constitute 80% of the total vehicle fleet. The initiatives planned are as follows:

- To incentivise local manufacturing investments, ensuring continued co-funding of public charging infrastructure;
- To enforce stringent emissions standards to discourage non-EEV manufacturing;
- To expand awareness of EV benefits and increase the availability of EV models;
- To encourage strong development of xEV⁵ manufacturing capabilities to achieve 90% local xEVs manufacturing; and
- To streamline regulatory processes to reduce challenges associated with EV adoption, including those related to the establishment of charging infrastructure and regulatory hurdles

GM-LV4: Accelerate electrification of light vehicles segment (E2W)

This initiative focuses on accelerating the electrification of light vehicles in the E2W⁶ segment. By 2050, the NETR aims to accelerate the adoption of E2Ws to constitute 80% of the total vehicle fleet. The initiatives include:

- To offer incentives to reduce the purchase or leasing costs of E2Ws, particularly targeting B40 households, to accelerate the achievement of total cost of ownership parity with ICE 2Ws;
- To promote the expansion of E2W model availability through local manufacturing and support for foreign manufacturers' entry into the market; and
- To closely monitor the development of E2W charging infrastructure and establish battery charging standards for both public and home charging

NETR flagship projects

The flagship projects within the National Energy Transition Roadmap (NETR) framework are designed to showcase a diverse range of technological solutions and approaches required in facilitating Malaysia's energy transition journey. These projects will be organised by various entities.

The primary goal of these flagship projects is to drive substantial investment into the energy transition sector, with an estimated total investment of over RM25 billion.

In doing so, these projects aim to create significant employment opportunities, with an anticipated 23,000 jobs being generated across the various initiatives.

Figure 5: NETR flagship projects across various energy transition levers



Future Mobility project

The concept of Future Mobility encompasses the vision and strategies aimed at transforming the future of transportation by promoting innovative, sustainable, and efficient mobility solutions. There are 3 modalities outlined below:

- EV charging stations;
- Public transport electrification; and
- Solar photovoltaic (PV) installation for rail operations

EV charging stations

The first project involves installing 10,000 EV charging stations in collaboration with various strategic partners, including TNB, Plus Malaysia Berhad (PLUS), Permodalan Nasional Berhad (PNB), Gentari, and Sunway Group, by the year 2025. These stations will be strategically placed along highways and at specific commercial locations to support the growing EV infrastructure.

Public transport electrification

This project aims to electrify the initial and final segments of public transportation, which includes enhancing the infrastructure and electrical systems at bus depots to accommodate charging needs.

It also creates opportunities for local small and medium sized enterprises (SMEs) in maintenance, repair, and overhaul (MRO) services related to these electrified public transport systems.

Solar PV installation for rail operations

The Rail Sector Energy Management and Renewable Energy (EMRE) Action Plan entails installing solar photovoltaic (PV) systems in rail operations, specifically in stations and depots, to generate electricity for non-traction purposes.

Government incentives turbocharging the transition

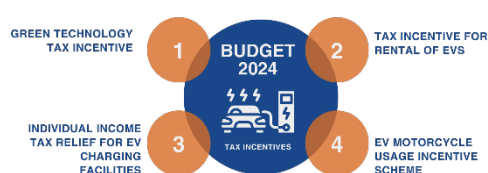
The Malaysian government allocated RM200 billion from financial institutions to incentivise the adoption of EVs in Budget 2024, demonstrating its commitment to facilitating the transition to a low-carbon economy.

This substantial funding is expected to provide businesses and industries with the

necessary resources to adopt and implement low-carbon technologies, processes, and practices.

On top of that, the government also introduced a variety of tax incentives for green mobility, which are outlined below:

Figure 6: Budget 2024 tax incentives relating to EVs



Green Technology Tax Incentive

This scheme consists of the Green Investment Tax Allowance (GITA) and the Green Income Tax Exemption (GITE) incentives which provide tax breaks to companies undertaking certain qualifying green activities.

Green Investment Tax Allowance (GITA)

This incentive offers 100% income tax allowance on capital expenditure for qualifying green activities either for the purposes of a business or own consumption. The incentive period spans a duration of up to ten years, and companies can utilise this allowance to set off up to 70% of their statutory income. This encourages businesses to invest in and adopt environmentally friendly technologies and practices, thereby reducing their overall environmental impact.

Table 2: GITA project – Business purposes

Qualifying activities	%GITA	% of statutory income to be set-off	Incentive period
Tier 1: <ul style="list-style-type: none"> Green hydrogen 	100%	100% or 70%	Up to 10 years (5+5)
Tier 2: <ul style="list-style-type: none"> Integrated waste management EV charging station 	100%	100%	5 years
Tier 3: <ul style="list-style-type: none"> Biomass Biogas Minor hydro Geo thermal Solar Wind energy 	100%	70%	5 years

Table 3: GITA asset – Own consumption

Qualifying activities	%GITA	% of statutory income to be set-off	Incentive period
Tier 1: <ul style="list-style-type: none"> List of qualifying assets approved by MoF Battery Energy Storage System (BESS) Green building 	100%	70%	Qualifying capital expenditure ⁷ incurred from 1 January 2024 to 31 December 2026.
Tier 2: <ul style="list-style-type: none"> List of qualifying assets approved by MoF Renewable Energy System Energy efficiency 	60%	70%	

⁷ Qualifying capital expenditure would be as verified by the Malaysian Green Technology and Climate Change Corporation for the purchase of green technology assets starting from 1 January 2024 until 31 December 2026.

Green Income Tax Exemption (GITE)

The Green Income Tax Exemption provides two types of exemptions:

- A 70% income tax exemption on statutory income for qualifying green services activities over a three-year assessment period; and
- A 70% income tax exemption on statutory income for up to ten years of assessment specifically for solar leasing activities.

Table 4: Green Income Tax Exemption (GITE)

Tier	Tax exemption on statutory income	Incentive period
>3MW - ≤10MW	70%	5 years
>10MW - ≤30MW		10 years

Extension of Tax Incentive for EV rentals

This incentive is designed to boost the adoption of eco-friendly vehicles and foster the growth of a sustainable mobility ecosystem by motivating businesses to invest in EVs. The suggested tax deduction, set at a maximum of RM300,000 per vehicle for EV rentals, will be prolonged for an extra two years, lasting until the assessment year 2027.

This extension serves to not only entice companies to integrate EVs into their activities but also to stimulate the expansion of the EV rental market.

Extension of Individual Income Tax Relief for EV Charging Facilities

The government also offers individual income tax relief, allowing deductions of up to RM2,500 for costs associated with the installation, rental, purchase (including hire-purchase) of equipment, or subscription fees for EV charging facilities during the years of

assessment 2022 and 2023.

To provide further support to the local EV sector and align with the New Industrial Master Plan 2030, this proposal will be extended for a period of four years from the year of assessment 2024 to year of assessment 2027.

Electric Motorcycle Usage Incentive Scheme

Lastly, this particular scheme offers a rebate of up to RM2,400 to electric motorcycle buyers with an annual income of less than RM120,000.

By providing financial incentives to lower-income individuals, the government aims to make electric motorcycles more accessible and affordable, thereby encouraging a stronger shift towards cleaner and more sustainable modes of transportation.

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