

# Chapter 1

## EV Policies in ASEAN Countries

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# Chapter 1

## EV Policies in ASEAN Countries

This chapter provides an overview of electric vehicle (EV) policies in the selected ASEAN countries. The chapter investigates the EV policies and targets, the current status of EV introduction, the EV reuse plan, as well as the battery reuse policy.

### 1. Country Policies

#### 1.1. Brunei Darussalam

- **Decarbonisation Policy in the Transport Sector**

Brunei Darussalam's Land Transport Master Plan sets forth the standards, regulations, processes, and systems to be defined and implemented for transport infrastructure and operations across Brunei to minimise the overall impact on the natural and built environment, minimise the carbon footprint, and maintain local air and noise quality. The plan includes the following specific policies.

- Develop an environmental impact assessment for all major transport initiatives before implementation.
- Promote energy efficiency and a reduction in carbon emissions through a carbon reduction blueprint.
- Progressively tighten emissions standards for new, imported, and existing vehicles.
- Fully recognise and support the Heart of Borneo initiative working in collaboration with the governments of Malaysia and Indonesia.
- Develop and apply appropriate planning standards, including promoting the concept of liveable neighbourhoods where local trip-making by walking and cycling is encouraged.

- **EV Policy and Target**

The Government of Brunei Darussalam believes that EVs are a powerful means of transportation, as they focus on short-range transportation that can be recharged relatively inexpensively with electricity. Furthermore, Brunei's National Climate Change Policy plans to set EV sales at 65% of vehicle sales by 2035. To achieve this goal, the government will make policy decisions by controlling EV prices and expanding the number of charging stations, including through excise tax incentives and the like, as well as paying attention to electricity and vehicle licence fees. The Electric Vehicle Joint Task Force composed of relevant stakeholders was established in 2019 to ensure the implementation of EV promotion policies. In addition, pilot projects such as the development of charging stations are currently being implemented through government initiatives.

- **Current Status of Introduction of EVs and Charging Infrastructure**

There is no statistically reliable information on the number of EVs introduced or the number of charging stations in Brunei.

- **Vehicle Registration Fees**

According to Brunei’s Land Transport Department, a vehicle licence costs B\$2.25 per privately-owned car per 100 cylinder capacity (cc) (Table 1.1). Registration fees and road taxes are also charged. Brunei publishes the road price for each car, which includes the showroom price or vehicle price, registration fee, vehicle insurance, and so on (Table 1.2).

**Table 1.1. Vehicle Licence Fees in Brunei Darussalam**

<b>Types</b>	<b>Fees (per 100 cc)</b>	<b>Frequency of Renewal</b>
Motorcycles and Private Cars	B\$2.25	7 years of age and above – renewal every year
Taxis	B\$4.5	After first year of registration – renewal every 6 months
Commercial	B\$4.5	After first year of registration – renewal every 6 months (except for company registered cars, inspection is done annually once reaching 7 years of age and above)
Motor Omnibus	B\$6.0	After first year of registration – renewal every 6 months
Trailers	B\$10	After first year of registration – renewal every 6 months
Dealer’s General Licence	B\$100	Every year

cc = cylinder capacity.

Source: Brunei Darussalam Department of Economic Planning and Statistics.

**Table 1.2. Example of 'On the Road Price' in Brunei Darussalam**

<b>Car: 2,500 cc or 2.5 litre</b>	
Showroom price	B\$49,900
+Registration fee	B\$25
+ Licence plate	B\$40
+ Road tax	B\$57
+ Vehicle insurance	B\$1,832
<b>On the road price</b>	<b>B\$51,854</b>

cc = cylinder capacity.

Source: Brunei Darussalam Department of Economic Planning and Statistics.

- **Economic Incentives for EV Owners**

Brunei launched a 2-year pilot project on EVs on 25 March 2021. Until the licence fee for EVs is decided through this pilot project and put into effect, both participants and nonparticipants of the project are exempt from paying vehicle licence fees.

- **Economic Incentives for Charging Infrastructure Development**

According to the Brunei Darussalam National Climate Change Policy, the Electric Vehicle Joint Task Force is set to collaborate with key relevant government agencies, main industry players, and other private sector parties to increase access to charging facilities and other supporting infrastructure. No specific information has been released.

- **Economic Incentives for Manufacturers**

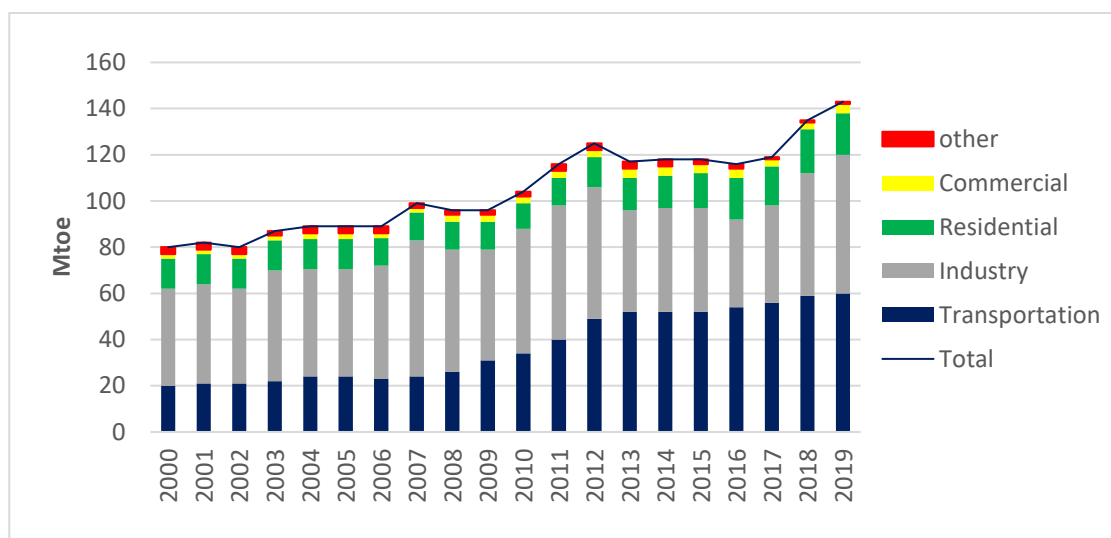
No specific information has been released.

## **1.2. Indonesia**

- **Decarbonisation Policy of the Transport Sector**

The transport sector accounts for approximately 40% of Indonesia's total energy consumption and the amount is increasing (Figure 1.1).

**Figure 1.1. Development of Final Energy Consumption by Consuming Sectors**



Mtoe = million tons of oil equivalent.

Source: Indonesia Long-term Strategy and Climate Resilience 2050.

[https://unfccc.int/sites/default/files/resource/Indonesia\\_LTS-LCCR\\_2021.pdf](https://unfccc.int/sites/default/files/resource/Indonesia_LTS-LCCR_2021.pdf)

Indonesia has set three measures to decarbonise the transport sector in its long-term plan.

- electrification of transport
- supplying more biofuels for diesel substitute
- gasoline substitute

In particular, the country puts priority on electrifying vehicles and is working not only on using EVs but also manufacturing them in the country as a national initiative. More information is provided in the EV policy and target section. The country plans to utilise fatty acid methyl-ester and bio-hydrocarbon or green diesel for biofuels, and bioethanol and crude palm oil-based gasoline for gasoline substitutes. The government introduced biofuels derived from crude palm oil in 2011, which are blended with petroleum diesel and called B20 (20% biodiesel plus 80% petroleum diesel).

- **EV Policy and Target**

To reduce the expected potential increase in oil imports and to nurture the domestic automobile manufacturing industry, the country has set a target to abandon the sale of gasoline-powered two-wheelers by 2040 and internal combustion engine (ICE) vehicles by

2050.<sup>1</sup> Indonesia also intends for alternative-powered vehicles to account for 20% of total vehicle production by 2025.<sup>2</sup>

As Table 1.3 shows, Indonesia is electrifying both four-wheeled and two-wheeled vehicles. In January 2019, Indonesia released an automotive industry roadmap regarding the number of units of EVs produced. It has set a target for low-carbon emissions vehicles to account for 30% (or 1.2 million units) of the total four-wheeler production target of 4 million units in 2035. It has set a target to produce 15 million two-wheelers in total in 2035, 30% of which will be electric.

Indonesia has formulated Presidential Regulation, No. 55 Year 2019 Regarding Acceleration of Battery-Based Electric Vehicle Program for Road Transportation. Aside from promoting EVs for energy security enhancement and environmental purpose, Indonesia's EV policy is to focus on domestic manufacturing. Taking advantage of the availability of essential metals domestically, Indonesia aims to become an EV manufacturing hub.

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<sup>1</sup> Ministry of Energy and Mineral Resources of the Republic of Indonesia. [Ini Prinsip dan Peta Jalan Pemerintah Capai Net Zero Emission] <https://ebtke.esdm.go.id/post/2021/10/11/2986/ini.prinsip.dan.peta.jalan.pemerintah.capai.net.zero.emission>

<sup>2</sup> Indonesia: 20% EV by 2025. <https://www.globalfleet.com/fr/connected-technology-and-innovation/asia-pacific/features/indonesia-20-ev-2025?a=YHE11&t%5B0%5D=Lithium%20ion%20battery&t%5B1%5D=Hyundai&t%5B2%5D=Mitsubishi&curl=1>

**Table 1.3. Indonesia's EV Target**

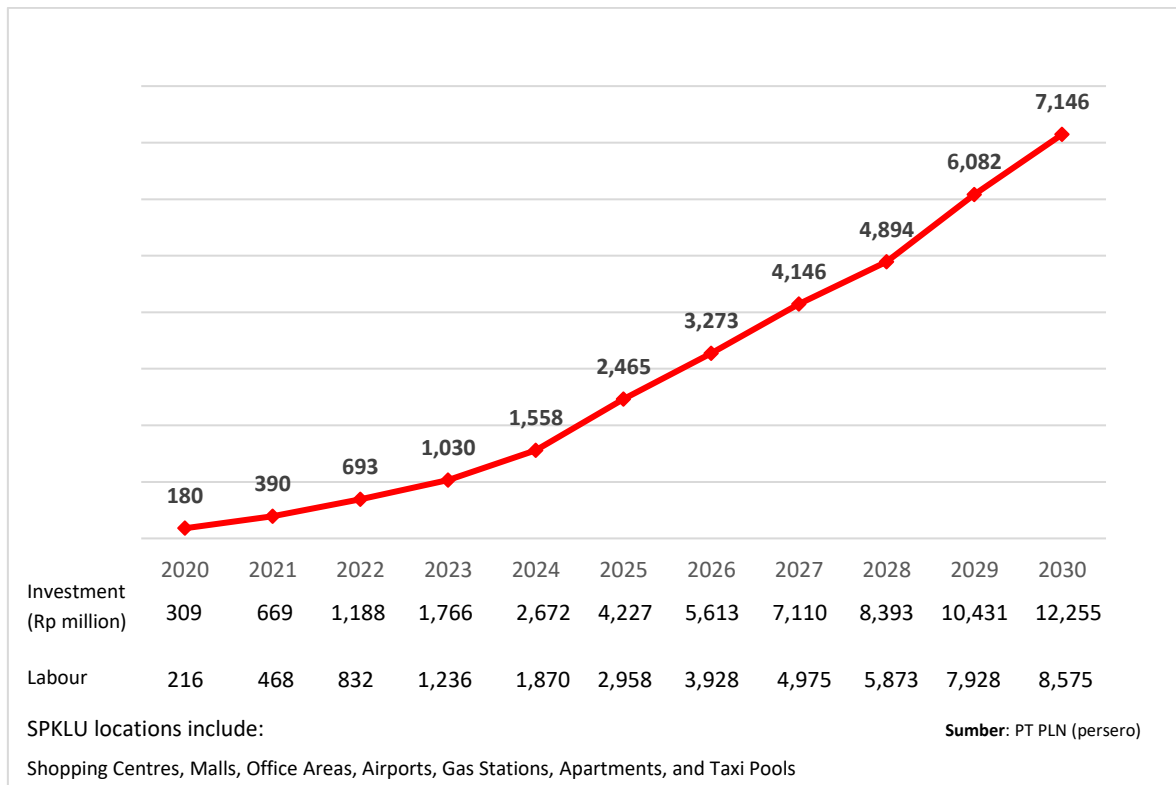
Item		2020	2025	2030	2035	
Motor Vehicles	Production	Total (Unit)	1,500,000	2,000,000	3,000,000	4,000,000
		LCEV (%)	10	20	25	30
		LCGC (%)	25	20	20	20
	Sales	Total (Unit)	1,250,000	1,690,000	2,100,000	2,500,000
	Export	Total (Unit)	250,000	310,000	900,000	1,500,000
Motorcycles	Production	Total (Unit)	8,000,000	10,000,000	12,500,000	15,000,000
		Electric Motorcycle (%)	10	20	25	30
	Sales	Total (Unit)	7,500,000	9,000,000	11,000,000	13,000,000
	Export	Total (Unit)	500,000	1,000,000	1,500,000	2,000,000

Note: LCEV = low carbon emissions vehicle, LCGC = low cost green car.

Source: Indonesia's Strategy on Low Carbon Emission Vehicle and Automotive Standard (2018). <http://www.catarc.org.cn/Instandard//UploadFile/2019/12/16/3-Indonesia-Mr.%20Putu%20Juli%20Ardika%20-%20CATARC%20221018.pdf>

Indonesia has formulated Ministerial of EMR Regulation No. 13 Year 2020 Regarding Provision of Charging Infrastructure for Battery-based Electric Vehicles. There are two types of charging facilities: private electricity installations and public electric charging stations (SPKLU). The target for private electricity installations is to install 31,859 units<sup>3</sup> by 2030. The target for public electricity charging stations is to increase their number to 7,146 units by 2030 (Figure 1.2). There is also a target to increase the number of swap battery stations for 2-wheelers to 22,500 locations by 2035 (Figure 1.3).

**Figure 1.2. Roadmap of Charging Stations Infrastructure in Indonesia**



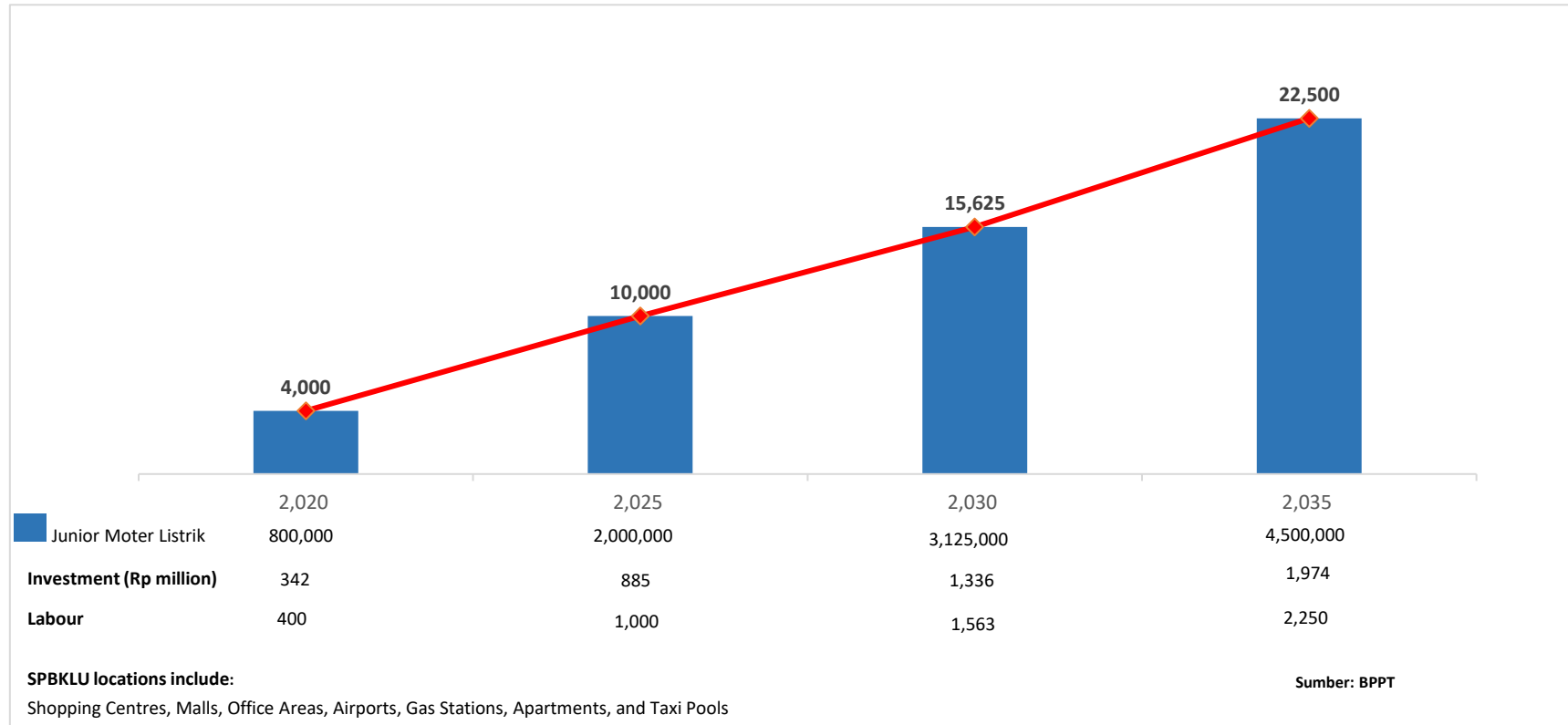
SPKLU = *Stasiun Pengisian Kendaraan Listrik Umum* (Public Electric Vehicle Charging Station).

Source: Provision of Electricity Charging Infrastructure and Electricity Rate for Battery-based Electric Motor Vehicles (2020). [https://gatrik.esdm.go.id/assets/uploads/download\\_index/files/683a2-bahan-presentasi-pak-hendra-1-.pdf](https://gatrik.esdm.go.id/assets/uploads/download_index/files/683a2-bahan-presentasi-pak-hendra-1-.pdf)

<sup>3</sup> <https://peraturan.bpk.go.id/Home/Details/171112/pp-no-74-tahun-2021>



Figure 1.3. Roadmap of Swap Battery Stations in Indonesia



SPBKLU = *Stasiun Penukaran Baterai Kendaraan Listrik Umum* (Public Electric Battery Exchange Station).

Source: Provision of Electricity Charging Infrastructure and Electricity Rate for Battery-based Electric Motor Vehicles (2020).

[https://gatrik.esdm.go.id/assets/uploads/download\\_index/files/683a2-bahan-presentasi-pak-hendra-1-.pdf](https://gatrik.esdm.go.id/assets/uploads/download_index/files/683a2-bahan-presentasi-pak-hendra-1-.pdf)

- **Current Status of Introduction of EVs**

Indonesia’s HEV/PHEV sales number in 2021 was 2,508, and BEVs accounted for 685 units in the same year. This represents 0.36% of total sales of vehicles. The total passenger vehicle sales in 2021 was 887,202, which was 1.67 times higher than the previous year but still below pre-pandemic levels (Table 1.4).

**Table 1.4. Number of HEV/PHEV and BEV Registrations, 2019, 2020, and 2021 in Indonesia**

Year	HEVs/PHEVs	BEVs	Total of EVs	Total Passenger Vehicle Sales
2019	351	0	351	1,030,126
2020	1,114	120	1,234	532,027
2021	2,508	685	3,193	887,202

BEV = battery electric vehicle, EV = electric vehicle, HEV = hybrid electric vehicle, PHEV = plug-in hybrid electric vehicle.

Source: GAIKINDO. Indonesian Automotive Industry Data. <https://www.gaikindo.or.id/indonesian-automobile-industry-data/>

EV sales are still extremely small but are growing. xEV sales have grown by nearly nine times compared to 2019, although there is still a considerable gap with the target EV production share of 10% in 2020 or 20% in 2025. Whilst the production targets in the EV roadmap include exports, more widespread adoption of EVs within the country is essential for meeting the target.

- **Current Status of EV Charging Infrastructure**

As of February 2022, there were 267 electric vehicle charging station (EVCS) units across 224 sites. Of those EVCSs, the state power company PLN owns 120 units installed across 92 sites (Kompas, 2022). For reference, there were more than 5,500 conventional petroleum fuel stations in Indonesia as of the end of 2020.

The Indonesian Ministry of Energy and Mineral Resources has a target to install EV charging stations at 695 locations in fiscal year (FY) 2022. PLN also has a target to build 580 SPKLU (EVCS for four-wheelers) in FY2022 and 4,900 swap battery stations for two-wheelers (SPBKLU) (Thai Ministry of Energy and Mineral Resources, 2022).

- **Vehicle Registration Fees**

Indonesia has two types of registration taxes: the vehicle ownership tax (BPKB) and the vehicle registration fee (STNK).

A BPKB is required when owning a vehicle. It is a one-time tax charged when a vehicle ownership certificate is issued. The amount varies between two-wheelers and four-wheelers as follows.

- two-wheelers and three-wheelers: Rp225,000 (\$16)
- four-wheelers: Rp375,000 (\$26)

A STNK is a tax charged upon vehicle registration, which must be renewed every 5 years. The amount varies between two-wheelers and four-wheelers as follows.

- two-wheelers and three-wheelers: Rp100,000 (\$7)
- four-wheelers: Rp200,000 (\$14)

- **Economic Incentives for Owners of xEVs**

There are two types of economic incentives for xEV owners: lower luxury tax rates and an electricity tariff discount.

- Lower Luxury Tax Rates

The luxury tax has been reduced based on Government Regulation No. 73 of 2019 (GR-73) put into force in 2019, which set the luxury tax rate for PHEVs, BEVs, and FCEVs to 0% to spur EV sales (PWC, 2019).

However, as shown in Table 1.5, the tax rates for HEVs, PHEVs, and BEVs were revised in October 2021 to differentiate between the various EVs.

Whilst the tax rate remained at 0% for BEVs, it was raised for PHEVs and HEVs. As Finance Minister Sri Mulyani Indrawati said, ‘... investors in EV manufacturing in Indonesia feel that EVs are not as competitive as they should be because their tax rate is not differentiated from PHEVs (DDTC News, 2021). The revision is presumably intended to differentiate the tax rate of BEVs from HEVs and PHEVs.

**Table 1.5. Indonesia’s Luxury Tax on EVs, Plug-in Hybrids, and Hybrids**

Category		CO <sub>2</sub> -g/km	Gasoline/Diesel (l/km)	Tax Rate
Incentive Programme	BEV/FCEV	-	-	0%
	PHEV	≤100	28	5%
	Full hybrid	<100	23/26	6%
		100–125	18.4/20	7%
		125–150	15.5/17.5	8%
	Mild hybrid	<100	23/26	8%
		100–125	18.4/20	10%
		125–150	15.5/17.5	12%

BEV = battery electric vehicle, FCEV = fuel cell electric vehicle, PHEV = plug-in hybrid electric vehicle, km = kilometre, l = litre.

Source: Government issued Regulation Number 74 of 2021 (PP-74). <https://peraturan.bpk.go.id/Home/Details/171112/pp-no-74-tahun-2021>

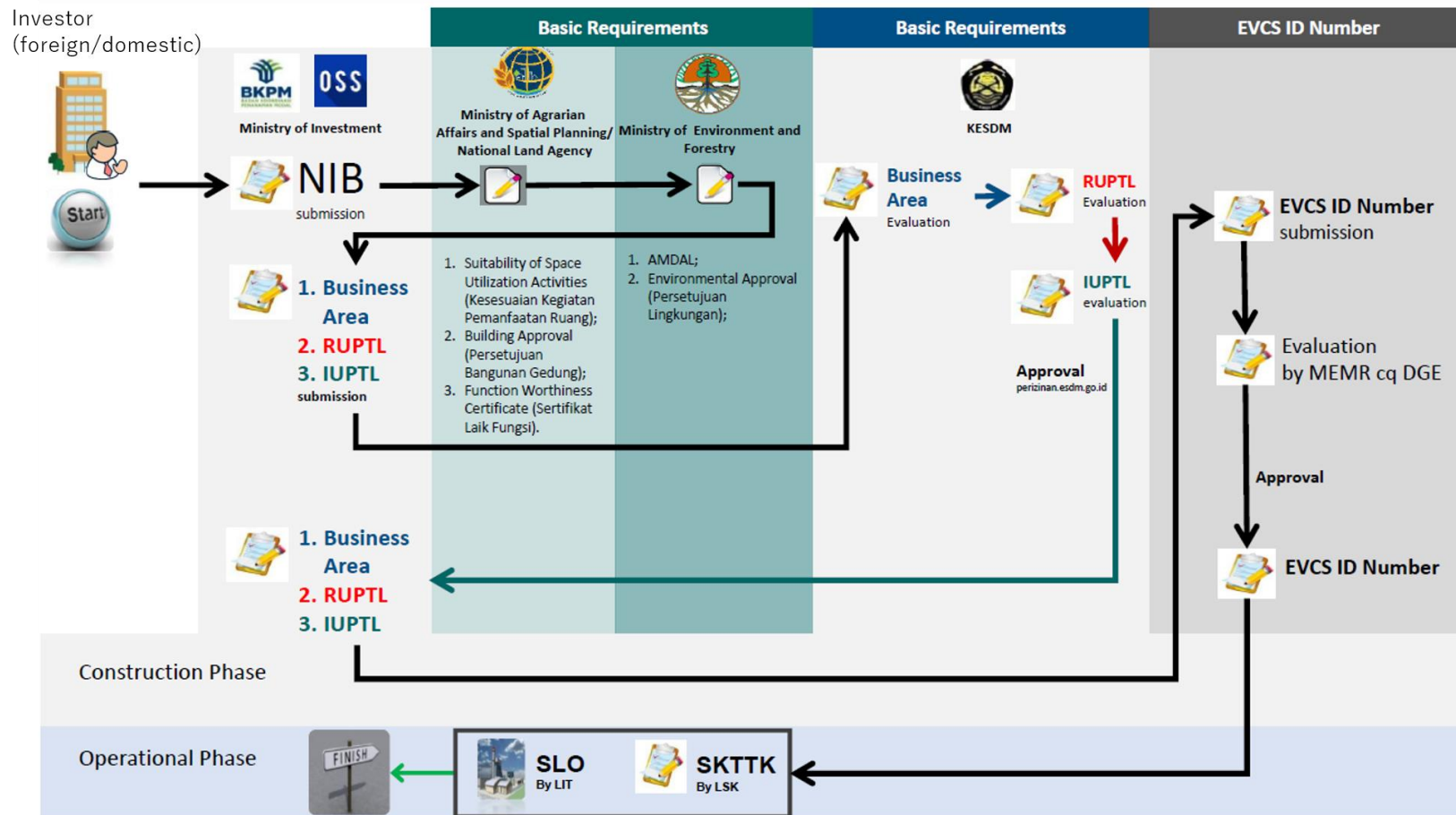
- Electricity Tariff Discount

As an economic incentive for using EVs, Indonesia’s state power company PLN offers a 30% electricity tariff discount between 10:00 p.m. to 5:00 a.m. for those who own EVs (PLN, 2022). This system not only curbs evening peak electricity rates as an economic incentive for EV owners,, but also increases power consumption during the low demand, night-time hours.

- Provisions for Charging Infrastructure Development

A business permit must be obtained for operating a SPKLU business. Power companies applying for a permit must fulfil the requirements related to suitability of space utilisation activities, building approval, and environmental approval. The application scheme is shown in Figure 1.4.

Figure 1.4. Business Permit Application Scheme



DGE = Directorate General of Electricity, EVCS = electric vehicle charging station, ID = identification, IUPTL = Izin Usaha Penyediaan Tenaga Listrik, RUPTL = Rencana Usaha Penyediaan Tenaga Listrik, MEMR = Ministry of Energy and Mineral Resources, OSS = online single submission, SLO = Sertifikat Laik Operasi, SKTTK = Sertifikat Kompetensi Tenaga Teknik Ketenagalistrikan

Source: EV Regulation in Indonesia. Presentation Slide at 1st Online Meeting (28 February 2022).

- **Economic Incentives for Manufacturers**

There are three major economic incentives in place for manufacturers.

- Corporate Tax Reduction

A tax reduction is provided for varying lengths of time depending on the amount of capital expenditure, acting as an incentive for industries designated as pioneer industries (Regulation No. 150/PMK.010/2018 (PMK-150) (Table 1.6).

**Table 1.6. Conditions for Corporate Tax Reduction**

Provision	New Capital Investment		Investment (Rp)	Period in years
	Rp100 billion up to <Rp 500 billion	≥Rp 500 billion		
Corporate Income Tax Reduction Rate	50%	100%	500 billion up to <1 trillion	5
Concession Period	5years	5-20 years	1 trillion up to <5 trillion	7
Transition Period	25% CIT Reduction for the next 2 years	50% CIT Reduction for the next 2 years	5 trillion up to <15 trillion	10
			15 trillion up to <30 trillion	15
			≥30 trillion	20

CIT = Corporate Income Tax (The rate in Indonesia is 22%.)

(<https://taxsummaries.pwc.com/indonesia/corporate/taxes-on-corporate-income>).

Source: BDO Indonesia (2018), 'Tax Holiday Revamped', Newsletter, 19 December.

The EV businesses eligible for the tax reduction are shown in Table 1.7.

**Table 1.7. EV Operators Eligible for Tax Reductions**

No	Indonesia Standard Industrial Classification (KBLI)	Type of Production
1	29100	Manufacturing of four-wheeled or more electric vehicles that are integrated with batteries and electric motors
2	29300	• Manufacturing of four-wheeled or more electric motor vehicles
		• Manufacturing of electric motor for four-wheeled or more electric motor vehicles
		• Manufacturing of flexy engines that are compatible with 100% biodiesel for four-wheeled or more motor vehicles
		• Manufacturing of two main components minimum for engines of four-wheeled or more vehicles (i.e. piston, cylinder head, cylinder block, camshaft, crankshaft, and connecting rod that are integrated with manufacturing of four-wheeled or more motor vehicles
		• Manufacturing of electric power control units for four-wheeled or more electric motor vehicle
3	30912	• Manufacturing of batteries for two-wheeled or three-wheeled electric motor vehicles
		• Manufacturing of electric motors for four-wheeled or three-wheeled electric motor vehicles
		• Manufacturing of electric power control units for four-wheeled or three-wheeled electric motor vehicles

Source: Regulation Number 130/PMK.010/2020 (PMK-130).

<https://peraturan.bpk.go.id/Home/Details/148016/pmk-no-130pmk0102020>

The programme provides corporate tax reductions for 5 to 20 years depending on the amount of investment, thereby stimulating Indonesia's economic growth, and boosting new capital investments in the auto industry.

- Income Tax Incentives

Table 1.8 lists the automotive manufacturing industries covered. Thirty percent of capital investment in the following auto manufacturing businesses can be deducted from taxable

income, by deducting 5% per annum for 6 years. This serves as an economic incentive to make new investments and expand businesses.

**Table 1.8. Eligible Auto Manufacturing Businesses**

Eligible to			
1	Four or more wheeled vehicle industry	29100	Public transportation for >42 passengers and/or trucks
2	Carosery industry for four or more wheeled vehicle industry and trailer and semi-trailer industry	29200	Manufacturing of parts of car or vehicle carosery
3	Manufacturing of spare parts and accessories for four or more wheeled vehicles	29300	Engines and engine parts, brake systems, axles and propeller shafts, transmission/clutch systems, steering systems, injectors, water pumps, oil pumps, fuel pumps, forging components, die casting components, stamping parts, etc
4	Manufacturing of component and equipment for two- or three-wheeled motorcycles	30912	Engines and engine parts, die casting components, brake systems, transmission systems

Source: Law of the Republic of Indonesia Number 9 of 2016.

<https://www.kemenkeu.go.id/media/6727/law-of-the-republic-of-indonesia-number-9-of-2016.pdf>

The following policies are also being implemented.

- Special credit for electric vehicles by PT. BRI Persero with an interest rate of 3.8% per year and a tenor of 6 years
- PT. PLN Persero provides a 100% discount for electricity upgrade for the owners of electric cars and a 75% discount for the owners of electric motorcycles
- Promotion provided by APM in the form of free charger units for the purchase of electric vehicles and free insurance for 1 year

### 1.3. Malaysia

- **Decarbonisation Policy in the Transport Sector**

Malaysia has formulated the National Transport Policy (NTP) 2019–2030 Prime Minister’s Office of Malaysia, 2019) to implement policy thrusts and strategies to strengthen its economic competitiveness, to make a strong social impact particularly on inclusiveness and accessibility, and at the same time mitigate the negative environmental impact of the transport system. NTP



2019–2030, the guideline for maintaining sustainable transport networks and services, consists of five policy thrusts and 23 strategies. The five policy thrusts are:

- Strengthen governance to create a conducive environment for the transport sector
- Optimise, build, and maintain transport infrastructure, services, and networks to maximise efficiency
- Enhance safety, integration, connectivity, and accessibility for seamless journey
- Advance towards green transport ecosystem
- Expand the global footprint and promote the internationalisation of Malaysia’s transportation services

• **EV Policy and Target**

Malaysia’s Ministry of Environment and Water has outlined the electrification of the transport system under the ‘Low Carbon Mobility Blueprint 2021–2030’. The blueprint entails Malaysia’s overall strategies related to the transport sector, including fuel economy improvement, EV and low emissions vehicle adoption, greenhouse gas (GHG) emissions reduction, and modal shifts towards energy efficient system.

In the blueprint, Malaysia aims to increase the share of EV sales in passenger vehicles. The targets are 9% in 2025 and 15% in 2030 (Table 1.9).

**Table 1.9. Target Sales Share of EVs in Malaysia**

Year	Current Status	Targets (2030)
Passenger vehicles	30,414 (BEV: 700)	15%
Motorcycles	2071	15%
Buses	35	10,000

Source: Country Report of Malaysia (1st Meeting of ERIA Research Project in FY2021).

To facilitate the sales increase, Malaysia plans to expand the charging systems to install 10,000 units (AC: 9,000 units, and DC: 1000 units) in 2025.

The public sector will lead the EV deployment as part of public procurement. In the time between 2021–2022, the share of EVs in the public procurement is targeted to account for 10%, and it is targeted to increase to 50% (2023–2025). From 2025 to 2030, Malaysia’s government will establish local product qualification for tender participation.

The blueprint includes the plan for economic incentives for BEVs and PHEVs summarised in Table 1.10.

**Table 1.10. Economic Incentives for the Purchase of EVs in Malaysia**

Year	2021–2022	2023–2025	2026–2030
BEVs	100% import and excise duty exemption for complete built units – for the sales of maximum 10,000 units	50% exemption	
PHEVs	100% import and excise duty exemption for complete built units – for the sales of maximum 90,000 units	75% exemption	50% exemption

BEV = battery electric vehicle, PHEV = plug-in hybrid electric vehicle.

Source: Ministry of Environment and Water (2021).

On charging infrastructure, the Malaysian government has set a target of 9,000 AC charging points and 1,000 DC charging points to be installed nationwide by 2025.

In 2020, the National Automotive Policy 2020 (NAP 2020) was officially launched. The policy aims to develop Malaysia as the leader in automotive manufacturing industry. The NAP 2020 focuses on next-generation vehicles (NxGV), Industrial Revolution (IR 4.0), and mobility-as-a-service (MaaS) (Christopher & Lee Ong, 2020).

- **Current Status of Introduction of EVs**

In 2021, the number of EVs in passenger vehicle stocks was 30,415 (Table 1.11).

**Table 1.11. Current Status of EVs in Malaysia**

	Current Status
Passenger vehicles	30,415 (BEV:700)
Motorcycles	2071
Buses	35

BEV = battery electric vehicle.

Source: Country Report of Malaysia (1st Meeting of ERIA Research Project in FY2021).

- **Current Status of EV Charging Infrastructure**

According to the Malaysia Green Technology and Climate Change Corporation, around 400 units have been installed across Peninsular Malaysia (November 2021). According to technical information on the web (TECHWIRE ASIA), approximately 500 units have been installed in Malaysia as a whole (August 2021).

- **Vehicle Registration Fees**

According to the Road Transport Department, Malaysia’s vehicle licensing fees vary depending on whether asset registration has been made. The fee is RM150 for cars below 1,500 cc without asset registration (Table 1.12).

There is a road tax of RM20 for private sedans 1,000 cc and below (Table 1.13). A payment of excise duties and sales tax will also be required (Table 1.14).

**Table 1.12. Vehicle Licensing Fees in Malaysia (RM)**

	<b>Without Asset Registration</b>	<b>With Asset Registration</b>
Private cars <1,500 cc	150.00	200.00
Private cars >1,500 cc	300	350
Company cars	500.00	550.00
Motorcycles	5.00	20.00
Trucks/machinery	60.00	110.00
Statutory body vehicles	500.00	550.00

cc = cylinder capacity.

Source: Malaysia Road Transport Department.

**Table 1.13. Road Taxes in Malaysia**

Cars (private, sedan)

<b>Engine Capacity</b>	<b>Fee</b>	
1,000cc and below	RM20.00	
1,001 cc–1,200 cc	RM55.00	
1,201 cc–1,400 cc	RM70.00	
1,401 cc–1,600 cc	RM90.00	
1,601–1,800 cc	RM200.00	RM0.40/cc from 1,600 cc
1,801 cc–2,000 cc	RM280.00	RM0.50/cc from 1,800 cc
2,001 cc–2,500 cc	RM380.00	RM1.00/cc from 2,000 cc
2,501 cc–3,000 cc	RM880.00	RM2.50/cc from 2,500 cc
Above 3,000 cc	RM2,130	RM4.50/cc from 3,000 cc

Trucks (business use)

<b>Tonnage</b>	<b>Fee</b>	
1,000 kg and below	RM0.00	RM0.06/kg from 0 kg
1,001 kg–1,500 kg	RM60.00	RM0.06/kg from 1,000 kg
1501 kg–2,500 kg	RM90.00	RM0.06/kg from 1,500 kg
2,501kg–5,000 kg	RM150.00	RM0.015/kg from 2,500 kg
5,001 kg–10,000 kg	RM187.50	RM0.011/kg from 5,000 kg
10,001 kg–20,000 kg	RM242.50	RM0.011/kg from 10,000 kg
20,001 kg–30,000 kg	RM352.50	RM0.011/kg from 20,000 kg
30,001 kg–40,000 kg	RM462.50	RM0.011/kg from 30,000 kg
40,001 kg–50,000 kg	RM572.50	RM0.011/kg from 40,000 kg
50,000 kg and above	RM682.50	RM0.011/kg from 50 000 kg

**Table 1.13. Continued**

Motorcycles

Tonnage	Fee
150 cc and below	RM 2.00
151 cc–200 cc	RM 30.00
201 cc–250 cc	RM 50.00
251 cc–500 cc	RM 180.00
501cc–800cc	RM 250.00
800 cc and above	RM 350.00

cc = cylinder capacity, kg =kilogramme.  
Source: Malaysia Ministry of Transport.

**Table 1.14. Import Duty and Local Taxes for Cars in Malaysia**

**A. Passenger Cars (including station wagons, sports cars, and racing cars)**

	Import Duty				Local Taxes	
	CBU		CKD		CBU & CKD	
Engine Capacity (cc)	MFN	ATIGA	MFN	ATIGA	Excise Duties	Sales Tax
<1,800	30%	0%	10%	0%	75%	10%
1,800–1,999	30%	0%	10%	0%	80%	10%
2,000–2499	30%	0%	10%	0%	90%	10%
Above 2,500	30%	0%	10%	0%	105%	10%

**B. Other Motor Cars**

	Import Duty				Local Taxes	
	CBU		CKD		CBU & CKD	
Engine Capacity (cc)	MFN	ATIGA	MFN	ATIGA	Excise Duties	Sales Tax
<1,500	30%	0%	nil	0%	60%	10%
1,500–1,799	30%	0%	nil	0%	65%	10%
1,800–1,999	30%	0%	10%	0%	75%	10%
2,000–2,499	30%	0%	10%	0%	90%	10%
Above 2,500	30%	0%	10%	0%	105%	10%

### C. Commercial Vehicles

	Import Duty				Local Taxes	
	CBU		CKD		CBU and CKD	
Class	MFN	ATIGA	MFN	ATIGA	Excise Duties	Sales Tax
All	30%	0%	nil	0%	nil	10%

ATIGA = ASEAN Trade in Goods Agreement, CBU = complete built unit, CKD = complete knock down, MFN = most favoured nation.

Source: Malaysian Automotive Association. 1 January 2019.

- **Economic Incentives for xEV Owners**

According to the National Low Carbon Mobility Blueprint 2021–2030, BEV-specific incentives are being planned.

Provide tax incentives (reducing) to bridge the price gap and build market trust

- BEV complete built unit excise duty and import tax exemption (for maximum 10,000 units in total) (2021–2022)
- 50% import duty and excise duty exemption (2023–2025)

Incentives specific to PHEVs are:

Provide tax exemption for qualified complete knock down PHEVs

- 100% exemption (2021–2022)
- 75% exemption (2023–2025)
- 50% exemption (2026–2030)

Further, the Ministry of Finance plans to propose the exemption of consumption tax on EVs and up to 100% exemption of the road tax for vehicle owners in FY2022. In addition, a personal income tax cut of up to RM2,500 is scheduled to be applied to the purchase and installation, leasing, and lease-purchase of EV chargers and payment of EV charger usage fees.

- **Economic Incentives for Charging Infrastructure Development**

Further, the National Low Carbon Mobility Blueprint 2021–2030 indicates that the following amounts will be provided as charger infrastructure installation funds to support PHEVs.

- RM5,000 per PHEV (2021–2025)
- RM3,000 per PHEV (2026–2030)

Tax incentives will be provided to private-sector charger businesses up to 2030 via the Green Income Tax Exemption (70% exemption on income tax).

- **Economic Incentives for Manufacturers**

The National Low Carbon Mobility Blueprint 2021–2030 plans to implement the following actions.

- Support research and development (R&D) activities of local EV makers and create business opportunities.
- Introduce a new tax incentive programme for ‘green’ industry including companies engaged in production, logistics, and services related to low-carbon transport.

- **EV and Battery Production Plan**

The blueprint includes the action plan for EV production as summarised in Table 1.15.

**Table 1.15. Action Plan of EV Increases Specified in ‘Low Carbon Mobility Blueprint 2021–2030’ in Malaysia**

Year	Electric Cars	Buses	Motorcycles
Action Plan	<ul style="list-style-type: none"> <li>• Government lead by example</li> <li>• Adopt EV cars for taxi fleet as part of taxi service modernisation and rebranding</li> <li>• Provide EV incentives for the market</li> <li>• Ensure EV charging infrastructure sufficient for private EV penetration</li> <li>• Provide R&amp;D grants and support to manufacturers of local EV cars</li> <li>• Build a holistic EV ecosystem</li> </ul>	<ul style="list-style-type: none"> <li>• Establish e-bus central procurement agency</li> <li>• Subsidise public transport electricity tariff and electricity Provide support to manufacturers of local EV buses</li> </ul>	<ul style="list-style-type: none"> <li>• Procure electric motorcycles for government enforcement fleet</li> <li>• Use electric motorcycles for delivery service</li> <li>• Develop battery swapping standard for electric motorcycles in Malaysia</li> <li>• Provide support to manufacturers of local electric motorcycles</li> </ul>

Source: Ministry of Environment and Water (2021).

- **Battery Reuse Plan**

The policy for reuse of EV battery is under formulation.

- **Variable Renewable Energy (VRE) Introduction Plan**

Currently, Malaysia's share in renewable electricity generation accounts for 2%, whilst the government plans to expand the share to 20% in 2025. Photovoltaics (PV) are expected to play an important role for meeting the target. Net metering is implemented in Malaysia, with the rooftop PV system playing an important role. Also, for facilitating large-scale PV introduction, Malaysia has implemented a large-scale solar bidding system of which first bidding took place in 2016, followed by those implemented in 2017 and 2019.

#### **1.4. Thailand**

- **Decarbonisation Policy in the Transport Sector**

The transport sector contributed the largest share of final energy consumption, at around 38.40% of the final energy consumption by economic sectors 2020. GHG emissions from transport, were 68,260.17 GgCO<sub>2</sub>eq (27.21%) by total direct GHG emissions from the energy sector in 2016 (Ministry of Natural Resources and Environment, 2021).

The Cabinet endorsed the Nationally Determined Contribution (NDC) Roadmap (2021–2030) in 2017 as a guidance to achieve its NDC targets. In the roadmap, the mitigation measures for the transport sector are (i) avoid and/or /reduce traveling, (ii) shift and /or maintain travel modes, and (iii) improve energy efficiency in transport with the mitigation target of 41.0 MtCO<sub>2</sub>eq in 2030. Thailand's roadmap for 2030 estimates that the transport sector will contribute about 36.3% of GHG emissions reduction.

The NDC Action Plan 2021–2030 was developed to support the implementation of the NDC Roadmap (2021-2030) and was prepared by the Office of Transport and Traffic Policy and Planning, Ministry of Transport. The NDC Action Plan 2021–2030 clarifies mitigation measures from related plans such as travel demand management, transit-oriented development,, expansion of railway network, and bus fleet upgrades to the GHG emissions reduction of 35.42 MtCO<sub>2</sub>eq in 2030.

The Energy Efficiency Plan 2018–2037 (EEP2018) was prepared by the Department of Alternative Energy Development and Efficiency, Ministry of Energy. EEP2018 has a goal of reducing energy intensity by 30% from 2010 levels by 2037. A total of 54,371 kilotons per oil equivalent (ktoe) of energy savings is expected by the end of the plan, with the focus areas of transport, industry, commercial and government buildings, residential and agriculture, with energy savings targets by 2037 of 17,682 ktoe, 21,137 ktoe, 6,418 ktoe, 3,300 ktoe, and 527 ktoe, respectively. The Master Plan for Sustainable Transport Development and Climate Change Mitigation and the transport system development was prepared by the Office of Transport and Traffic Policy and Planning, Ministry of Transport. This master plan includes (i) integrated transport systems, (ii) improved transport services, (iii) regulations and institutions, (iv) human resource development, and (v) innovation and technology strategies.



- **EV Policy and Target**

Thailand aims to be a major global production base for electric vehicles and parts. Under this vision, in February 2020, The National Electric Vehicle Policy Committee (NEVPC) was launched and in March 2020, the NEVPC announced a new EV roadmap to lead the country to become an EV hub in 5 years and to increase EV production to 30% of total annual automotive production or about 750,000 units out of 2.5 million units in Thailand by 2030 (EV 30@30 Policy).

In May 2021, the NEVPC established Thailand’s EV policy direction and each committee, which consist of (i) promoting of the manufacturing industry electric vehicles and parts, (ii) infrastructure and battery development to support electric vehicles, (iii) assessing the impact of fuel and GHGs from the promotion of electric vehicles, and (iv) promoting the electric vehicle adoption.

The EV policy direction is made up of a three-phase development plan. Under Phase 1 (2021–2022), the government will promote electric motorcycles and support infrastructure nationwide. Under Phase 2 (2023–2025), the EV industry will be developed to produce 225,000 cars and pick-up trucks, 360,000 motorcycles, and 18,000 buses and trucks by 2025, including the production of batteries. This first milestone is designed to deliver cost advantages via economies of scale. Phase 3 (2026–2030) is driven by the ‘30/30 Policy’ to produce 725,000 EV cars, pick-ups plus 675,000 EV motorcycles (Table 1.16) and to install 12,000 DC charging stations (Table 1.17). This will account for 30% of all auto production in 2030 and includes domestic manufacture of batteries. The NEVPC also sets financial and tax incentives, as well as safety standards, for EV and battery manufacturers.

**Table 1.16. Targets of EV Production and Usage in Thailand**

Year	Passenger Cars/Pickups		Buses/Trucks	
	Annual Production (million cars)	Usage (million cars)	Annual Production (million cars)	Usage (million cars)
2025	0.225	0.225	0.018	0.018
2030	0.725	0.44	0.034	0.033

Year	Motorcycles	
	Annual Production (million cars)	Usage (million cars)
2025	0.36	0.36
2030	0.675	0.65

Source: National Electric Vehicle Policy Committee.

**Table 1.17. Targets of EV Charging Stations in Thailand**

Year	Passenger Cars/Pickups	Motorcycles
Target	Target of DC charge	Total target station
2025	2,200–4,400	260
2030	12,000	1,450

Source: National Electric Vehicle Policy Committee.

- **Current Status of Introduction of EVs**

After the launch of the EV policies, the number of EV registrations has steadily increased. Table 1.18 shows the number of HEV and PHEV, and BEV registrations in Thailand. Between 2018 and 2021, the number of HEV and PHEV registrations has increased steadily (20,334 units in 2018 and 30,676 units in 2019, 32,264 units in 2020, and 42,800 in 2021). Similarly, the number of registered BEVs has greatly increased from 325 units in 2018 to 5,781 units in 2021. Meanwhile, it also shows that the number of HEVs and PHEVs outnumber that of BEVs, and the share of EVs in total automotive market has remained sluggish.

The Kasikorn Research Center indicated that the Thai BEV market has been stimulated by new government support measures, and that Chinese automakers are rapidly expanding their share of the BEV market on the strength of their low prices, capturing 80% of the total BEV market and expected to sell over 10,000 BEVs by 2022 (K-Research, 2022).

**Table 1.18. New HEV/PHEV, and BEV Registrations from 2018 to 2021 in Thailand**

Year	HEVs/PHEVs	BEVs	Total EVs	ICE Vehicles
2018	20,344	325	20,699	2,919,669
2019	30,676	1,572	32,248	2,952,140
2020	24,464/7,807	2,999	35,263	2,545,420
2021	35,740/7,060	5,781	48,581	2,584,088

Note: Motorcycles, buses, trucks, and motor-tricycles are also included.

EV = electric vehicle, BEV = battery electric vehicle, HEV = hybrid electric vehicle, ICE = internal combustion engine, PHEV = plug-in hybrid electric vehicle.

Sources: Thailand Department of Land Transport, Electric Vehicle Association in Thailand.

- **Current Status of EV Charging Infrastructure**

Since 2015, the number of charging stations in Thailand has gradually increased to 1,511 (normal chargers) and 774 (fast chargers) as of September 2021 (EVAT, n.d.).

In recent years, with the support of the Thai government, many start-ups (GridWhiz, Chosen Energy, EVF, The Fifth Element, Evolt, Future charge, Sharge management) and existing companies in Thailand, the oil and gas industry (PTT public company, Bangchak, Susco, Shell, Caltex Chevron), electricity sector (MEA, PEA, EGAT), green energy industry (Energy Absolute, GLT), and the automotive industry have entered the EV charging business (Thananusak, et al., 2021). For example, EGAT has indicated plans to increase the number of EV stations to 48 by 2021 and 90 by 2022, which would allow charging every 200–250 kilometres (EGAT, n.d.).

- **Vehicle Registration Fee**

The Thai government has implemented some taxes and levies associated with the purchase of vehicles. They are an excise tax and the vehicle registration fee.

**Excise Tax**

The Thai government approved the general framework of regulations on excise tax rates at a Cabinet meeting on 15 February 2022 (Thai Government, 2022). This decision is based on the Electric Vehicle Promotion Policy approved by the Cabinet on 15 February 2022. PHEVs (passenger cars and pickup trucks), EVs (passenger cars and pickup trucks), low-emissions eco-cars, and fuel cell (FC) pickup trucks will be subject to different new excise tax rates, e.g. 2% for EV passenger cars and 0% for EV pickup trucks until 31 December 2025, and 0% for FC pickup trucks until 31 December 2025, respectively, 0% until 31 December 2025, and from 1 January 2026 to 31 December 2035. The rate for EV pickup trucks is 0% until 31 December 2025, and 2% from 1 January 2026, up to 31 December 2035. For 21 other types of vehicles, the new tax rates will apply from 2026 to 2035. For example, for passenger cars up to 3,000 cc, the rate will be raised in stages, starting at 13% and increasing to 30% after 1 January 2030. The excise tax rate for passenger cars over 3,000 cc will be 50% from 1 January 2026 (Table 1.21).

**Vehicle Registration Fee**

New vehicle registration requires (i) new vehicle registration fee, (ii) vehicle tax (Thai Department of Land Transport), and (iii) compulsory vehicle insurance premium, in addition to optional vehicle insurance premium and parking fees. Vehicle inspection is required for motorcycles more than 5 years old and passenger cars, trucks, and buses more than 7 years old.

In Thailand, certification of vehicle storage space is not mandatory.

(1) New vehicle registration fee

The cost for new car registration consists of new car registration fee, car registration manual, licence plate, and vehicle inspection fee. For passenger cars, the total cost to register a new car is B565.

## (2) Vehicle Tax

Vehicle tax is an annual expense that is paid to the Department of Land Transport. Each car model has different vehicle tax rates depending on the type, size, engine power, and the service life of the car.

The tax for personal cars up to seven seats with general use, such as four-door sedans, four-door pickup trucks, etc. is calculated based on the rate determined for actual engine capacity (cc). For example, the vehicle tax of a new sedan with four seats and engine capacity of 1799 cc is B2,098.5.

Taxes for passenger cars for more than seven people, car hire, personal trucks and land transport are calculated based on the rate determined for vehicle weight and type of vehicle.

## (3) Compulsory Vehicle Insurance

Compulsory vehicle insurance is for all types of vehicles. It is a regulation under the Car Accident Protection Act 1992, if violated, there will be a fine of not more than B10,000.

**Table 1.19. Total Fee of New Vehicle Registration Fees and Taxes, Compulsory Vehicle Insurance Premiums**

Type of Vehicle	Total Fee of New Vehicle Registration Fees and Taxes* (baht, average in 2021)	Compulsory Vehicle Insurance Premiums** (baht)
Passenger Vehicles	2750	Personal, hiring/renting/public 600, 1,900
Buses	1901	Personal, hiring/renting/public 600, 1,900 (no more than 7 passengers) 1,100, 2,320 (no more than 15 seats) 2,050, 3,480 (15–no more than 20 seats) 3,200, 6,660 (20–no more than 40 seats) 3,740, 7,520 (over 40 seats) Runs between the distinct and the distinct in the province (hiring/renting/public only): 1,580 (no more than 15 seats) 2,260 (15–20 seats) 3,810 (20–40 seats) 4,630 (more than 40 seats)
Trucks	3448	Personal, hiring/renting/public

Type of Vehicle	Total Fee of New Vehicle Registration Fees and Taxes* (baht, average in 2021)	Compulsory Vehicle Insurance Premiums** (baht)
		900, 1,760 (no more than 3 tons) 1,220, 1,830 (3–6 tons) 1,310, 1,980 (6–12 tons) 1,700, 2,530 (more than 12 tons)
Motor cycles	100	EV: 300, 350 (personal, hiring/renting/public) ICE: 150 (no more than 75 cc) 300, 350 (75–125cc, individual, hiring/renting/public) 400 (125–150cc) 600 (more than 150cc)
Three-wheeler	325	EV: 500, 1,440 (personal, hiring/renting/public) ICE: personal, hiring/renting/public 720, 1,440 (Bangkok) 400, 400 (outside Bangkok)

Sources: \* Registration Fee and Tax – Ministry of Transport, Department of Land Transport, \*\* Compulsory Vehicle Insurance – Office of Insurance Commission.

<https://www.oic.or.th/th/consumer/อัตราเบี้ยประกันภัย-พรบ>

- **Economic Incentives for xEV Owners**

The Thai government approved a framework for a new electric vehicle promotion programme at a cabinet meeting on 15 February 2022 (Royal Thai Government, 2022). The promotion programme includes subsidies for the purchase of EVs, with B70,000 or B150,000 per vehicle for passenger cars depending on battery capacity, B150,000 per vehicle for pickup trucks, and B18,000 per vehicle for motorcycles. However, vehicles exceeding B2 million and motorcycles exceeding B150,000 are not eligible for the subsidy. The subsidy is scheduled to be provided from 2022 to 2025. The subsidy is provided to manufacturers and distributors, not consumers. Thus, subsidies are indirect incentives for xEV owners (Table.1.21).

BEVs have a 5–6 year tax exemption period, whilst PHEVs and HEVs receive a 5%–12.5% tax reduction depending on fuel economy.

Compulsory automobile insurance for EVs (passenger cars, motorcycles, and three-wheeled vehicles) is imposed a fixed insurance rate regardless of engine capacity.

- **Economic Incentives for Charging Infrastructure Development**

In April 2022, the Board of Investment of Thailand (BOI) approved revised incentives and conditions for investment in the EV charging station sector. In addition to the 5-year corporate

tax exemption applicable to investments in charging stations with 40 or more chargers (25% of which are DC), the revised measures now provide a 3-year tax incentive for smaller charging stations.

The revised measure also eliminates two conditions that prohibit investors from receiving additional benefits from other institutions and the ISO certification requirement.

It is required for Investors in charging stations to comply with relevant safety regulations and either plan to install EV smart charging systems or plan to connect to the 'EV Charging Network Operator Platform' The connection to the 'EV Charging Network Operator Platform' is required (Thai BOI, 2022).

- **Economic Incentives for Manufacturers**

As of 30 April 2022, the BOI granted investment incentives to 31 EV manufacturing projects, including seven HEV projects, seven PHEV projects, 14 BEV projects, and three electric bus projects, with a total investment of B57.87 billion (investment value excluding cost of land and working capital) and annual manufacturing capacity of 666,855 units. For EV components and batteries, the BOI also granted investment incentives to 11 projects for components and 18 projects for battery production, of which a total investment was B15.32 billion (investment value excluding cost of land and working capital) (Thai BOI, 2022).

In March 2021, the BOI announced a new tax incentive for next-generation automobiles in Decree 3/2564 (Thai BOI, 2021). Manufacturing only HEVs or PHEVs should not be eligible for the benefit, and manufacturing of BEVs must also be conducted. New tax incentives consist of a corporate tax incentive, which is 3 to 8-year corporate tax exemption on EVs and EV parts production depending on investment value (Table 1.20). Other incentives are R&D grants, human resource development grants, investment support for the establishment of a new EV battery pilot plants, and so on.

**Table 1.20. Tax Incentives for Manufacturers**

Products		
Battery Electric Four-Wheelers	Total investment capital of not less than B5 billion	BEVs: 8-year CIT exemption PHEVs: 3-year CIT exemption HEVs: no tax incentives +1 to 3-year exemption in case of R&D
	Total investment capital of less than B5 billion	BEVs 3-year: CIT exemption PHEVs 3-year: CIT exemption HEVs: no tax incentives maximum total of 11-year tax exemption available if all requirements are met
Battery Electric Motorcycles,		3-year CIT exemption maximum total of 11-year tax exemption available if all requirements are met
Battery Electric Three-Wheelers Buses and Trucks		3-year CIT exemption maximum total of 10-year tax exemption available if all requirements are met
Batteries		Pack assembly: 5-year CIT exemption Module production: 8-year CIT exemption Cell production: 8-year CIT exemption (no cap)
17 Key Parts of EVs		8-year CIT exemption

CIT = corporate income tax, EV = electric vehicle, BEV = battery electric vehicle, HEV = hybrid electric vehicle, PHEV = plug-in hybrid electric vehicle.

Source: Thailand BOI. Electric Vehicle Industry. [https://www.boi.go.th/upload/content/Smart\\_EV.pdf](https://www.boi.go.th/upload/content/Smart_EV.pdf)

The Cabinet meeting on 22 February 2022 also decided on a draft proposal for EV import tariff reductions and exemptions. The draft applies to both imports under general tariffs and imports through free trade agreements (FTAs) and will be in effect from 2022 to 2023. BEVs with a retail value not exceeding B2 million are exempt from duty if the tariff does not exceed 40% after using the FTA. If the tariff exceeds 40% under the same conditions, 40% of the tariff is reduced. In the case of imports with a general tariff of 80%, the tariff is reduced to 40%. BEVs with a retail value of B2 to B7 million are duty free if tariffs do not exceed 20% after using the FTA. If the tariff exceeds 20% under the same conditions, 20% of the tariff will be reduced. For imports under general tariffs, the rate is reduced to 60% (Table 1.21).

**Table 1.21. Economic Incentives for Manufacturers**

Type of Battery Electric Vehicle	Incentive			Condition**
	Subsidy	Tariff (Period 2022–2023)	Excise Tax (Period 2022–2025)	
Passenger Vehicle Retail price not exceeding B2 million	B70,000 for less than 30 kWh B150,000 for more than 30 kWh	Exemption from tariff rates less than 40% with FTA, 40% reduction from tariff rates exceed 40% with FTA, 40% tariff rates from tariff rates 80% without FTA	Exemption of excise duty to 2%	If production is to begin in Thailand in 2024, its scale shall be at least the same number of finished vehicles imported from 2022 to 2023, and in 2025, it shall be at least 1.5 times the number of finished vehicles imported from 2022 to 2023 Production of EV components can be divided into one of the following three categories: (i) battery cells, (ii) battery module assembly and one other electronic component, (iii) battery pack assembly and two other electronic components
Passenger Vehicle Retail price more than B2 million but less than B7 million	None	Exemption from tariff rates less than 20% with FTA, 20% reduction from tariff rates exceed 20% with FTA, 60% tariff rates for 80% tariff rates without FTA	Exemption of excise duty to 2%	
Pick Up Retail price not exceeding B2 million	B150,000 for more than 30 kWh	None	Exemption of excise duty to 0%	Production of EV components can be divided into one of the following three categories: (i) battery cells, (ii) battery module assembly and one other



Type of Battery Electric Vehicle	Incentive			Condition**
	Subsidy	Tariff (Period 2022–2023)	Excise Tax (Period 2022–2025)	
				electronic component, (iii) battery pack assembly and two other electronic components
Motorcycle Retail price not exceeding B0.15 million	B18,000	Exemption of tariff to 0%	None	EV components are expected to be produced domestically

Note: \*\* Vehicles manufactured in Thailand are eligible for the incentive.

EV = electric vehicle, FTA = free trade agreement, kWh = kilowatt hour.

Sources: Government of Thailand Official Gazette dated 30 May 2022. ([https://www.ratchakitcha.soc.go.th/DATA/PDF/2565/E/120/T\\_0015.PDF](https://www.ratchakitcha.soc.go.th/DATA/PDF/2565/E/120/T_0015.PDF)), News from Government of Thailand dated 22 February 2022 (<https://www.thaigov.go.th/news/contents/details/51817>).

- **EV and Battery Production Plan**

The national electric vehicle policy committee set the target of EV battery production of 1 million (20 gigawatt hours, GWh) in 2025 and 5.4 million (40 GWh) in 2030.

According to Kasikorn Research Center (K-Research), EVs market share in the next 5 years will increase to one-quarter, or 240,000 units, of the total car sales nationwide. When EV production is approaching its full capacity in 2023, it is expected that at least 260,000 units of EV batteries will be rolled out to serve the demands in Thailand.

In December 2021, Energy Absolute (EA), which is one of the largest renewable power producers in Thailand, opened a B6 billion (\$178 million) lithium-ion battery factory in Chachoengsao, a central Thai province home to many automotive companies. The plant is the first in Southeast Asia with an annual output capacity of 1 gigawatt hour, can produce batteries for 4,160 buses or 30,000 saloon cars in the first phase. EA plans to first produce batteries for 400 electric buses. EA's subsidiary Amita Technology (Thailand) Co, which operates the factory, uses pouch cell technology to make batteries with a lighter weight and a high-power storage (EA, 2021). At EAs battery production facility, EA also makes solvents for use in a battery recycling process, and has set up an electrolyte production unit for battery performance testing (Bangkok Post, 2021).

- **Battery Reuse Plan**

The application of battery energy storage systems in Thailand is in its infancy, and there is no official plan and target by the government with regard to battery reuse at present.

- **VRE Introduction Plan**

On the move to reinforce electricity security, the Ministry of Energy has amended its Alternative Energy Development Plan (AEDP) 2018, which covers operations from 2018 to 2037, to comply with the national electricity generating capacity development, increasing the ratio of renewable energy sources to 29.4 gigawatts (GW) or 34% of the national electricity generating capacity by 2037. The goal of the AEDP is to increase the share of renewable and alternative energy in electricity, heat, and biofuels to reach 30% of final energy consumption in 2037.

According to the latest amendment of the AEDP 2018, electricity generated from renewable energy sources will be introduced into the national power grid, with solar power 15.6 GW, biomass 5.8 GW, wind power 3.0 GW, and hydropower from domestic sources and Lao People's Democratic Republic 3.0 GW, and waste to energy 0.9 GW, respectively. And according to the latest amendment of the AEDP 2018, the target proportion of biofuel use to fuel demand in transportation in 2037 is 9.99%.

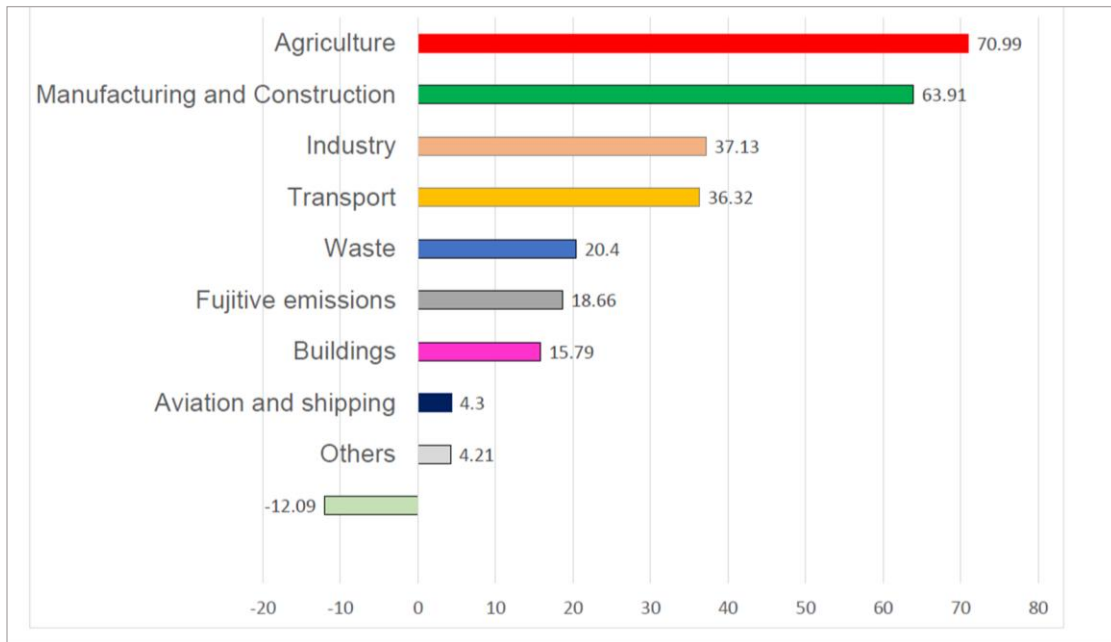
## **1.5. Viet Nam**

- **Decarbonisation Policy in the Transport Sector**

Under the Paris Agreement, Viet Nam has committed in its updated Nationally Determined Contribution (NDC) to cut GHG emissions by 9% in 2030, compared to the business-as-usual (BAU) scenario using domestic resources, with the increasing ambition to 27% against the BAU contingent upon receiving international support. To meet these GHG emissions reduction targets, road transport will have to reduce emissions substantially.

According to the Report for NDC Transport Initiative for Asia (Study of Electric Mobility Development in Viet Nam 2021/8), by the German research institute GIZ, transport volume is continuing to increase with an annual average growth rate of above 10% for passenger transport and above 5% for freight transport. With such a high increase, the GHG emissions reduction in the transport sector is challenging. The CO<sub>2</sub> emissions data organisation, OurWorld in Data, shows that Viet Nam's transport sector is the third biggest contributor, about 14.5%, to the country's GHG emissions in 2018 (Figure 1.5).

**Figure 1.5. Greenhouse Gas Emissions by Sector, Viet Nam, 2018**



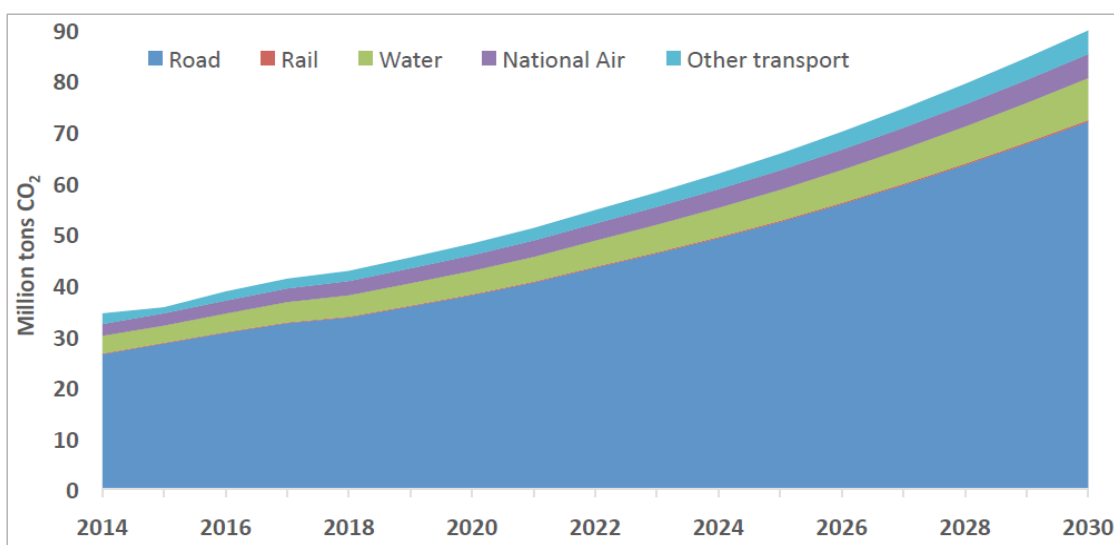
Note: Greenhouse gas emissions are measured in tonnes of carbon dioxide-equivalent (million tons).

Source: Our World in Data. Viet Nam CO<sub>2</sub> Country Profile.

<https://ourworldindata.org/co2/country/vietnam>

A World Bank report on climate change in transport stated that Viet Nam's transport sector's CO<sub>2</sub> emissions will increase from 33.2 million tons of CO<sub>2</sub> in 2014 to 89.1 million tons in 2030 under the BAU scenario. Within such forecast, road transport, the largest emitter at 26.4 million tons of CO<sub>2</sub> in 2014, with emissions to increase to 71.7 million tons in 2030 (Figure 1.6) (Oh et al., 2019).

**Figure 1.6. CO<sub>2</sub> Emissions Projection by Transport Subsectors under BAU Scenario**



BAU = business as usual.  
Source: Oh, et al. (2019).

As for the transportation policy at the national level, Resolution No. 55-NQ/TW on Orientation of National Energy Development Strategy to 2020 with a Vision to 2045 (2020/02), does orient policies to promote clean and renewable energy, especially in the industry and transport sector. Under Decision No.2707/QD-BGTVT in 2018, the Ministry of Transport (MOT) is responsible to develop an action plan for sustainable transport development. The MOT needs to develop different types of policies towards road transport, waterways, and aviation, and in particular in road transport, the MOT needs to adopt energy-efficient vehicles and mass public transport to tackle GHG emissions reduction as well as air pollution in big cities.

Motorbikes (motorised two-wheelers) are the predominant form of transportation in Viet Nam. More than 90% of vehicles in Viet Nam are motorbikes, which ranks Viet Nam as the fourth largest motorbike use country in the world. This massive motorbike market is starting to saturate, and with the increase in the middle-class wealth population, Viet Nam is starting to observe a steady market growth of automobiles (four-wheelers). However, for big cities, such as Ho Chi Minh City and Ha Noi, the deployment of energy-efficient and cleaner motorbikes and public transportation development are the main challenges.

- **EV Policy and Target**

There is no specific policy framework dedicated to EV deployment or EV charging station development. Resolution 55/NQ/TW (2020), National Energy Development Strategy, is the first and only official national document that requires the promotion of e-mobility.

The GIZ report (GIZ, 2021) shows the summary of central and local policies related to EV deployment.

The National Energy Development Strategy expects local governments to develop targets, policies, and programmes. Until now, two cities have developed EV promotion targets, with

the number of e-motorcycles reaching 5% of total motorcycles in Ha Noi by 2030, and the goal of 200 e-buses by 2025 in Nha Trang.

Da Nang City adopted Decision 124/QD-UBND to promote EV charging stations with policy encouragement of EV adoption. Da Nang City has a target of the number of charging stations of 150 Level 1–2 stations and 15 Level 3 stations by 2025, followed by 250 Level 1–2 stations and 50 Level 3 stations by 2030. With these exceptions, most cities are yet to set specific targets, incentives, or roadmaps for EV deployment.

There are also programmes run by cities to potentially promote clean transportation. Ha Noi and Ho Chi Minh City are trying to regulate ICE two-wheelers access to city centres with Decision 5953/QD-UBND: Restriction/Prohibition of Internal Combustion Engines (ICEs) access to city centres (GIZ, 2021).

- **Current Status of Introduction of EVs**

The EV four-wheeler and electric two-wheeler market in Viet Nam is in a very early stage, although e-bikes and e-motorcycles have been widely adopted in the market. By 2018, electric two-wheeler adoption exceeded 1 million, up from 500,000 in 2016. E-motorcycles are in an uptrend with a 46% increase in 2020. The number of domestically manufactured and assembled vehicles is rapidly increasing, whilst e-bikes are in a downtrend with a 15% decrease in 2020 (Table 1.22).

A negligible number of HEVs, PHEVs, and BEVs have been imported and sold in the domestic market – 140 vehicles in 2019, and 900 vehicles in 2020, mainly HEVs.

The domestic conglomerate Vingroup's subsidiary, VinFast entered the auto industry in 2017 with internal combustion engine cars, then released the first EV model in 2021. VinFast reportedly sold 24,000 cars domestically in 2021, which put the company in fourth place amongst automobile companies in Viet Nam. VinFast continues to increase EV models in 2022, to challenge the American market. During Consumer Electric Show in the U.S. earlier in 2022, VinFast said the company will cease production of engine cars by the end of 2022 (Nikkei Asia, 2022).

**Table 1.22. Penetration of E2W into Viet Nam’s Market**

	2016	2017	2018	2019	2020	2021
E2W numbers of vehicles	<b>501,400</b>	<b>728,451</b> (+45.3%)	<b>1,075,630</b> (+47.7%)			
			Vinfast brought "Klara" to market	Vinfast brought "Klara A2" with a battery swapping option.	Yadea put the first overseas production in Bac Giang province (target - 200,000 Eww/year)	Vinfast brought two new E2W Li-Ion battery.
	Imported from China, Japan, and Republic of Korea.			Domestic Production and Assembly (VinFast)		

E2W = electric two-wheelers.

Source: Le Anh, T. (2021), 'Promoting E-Mobility in Viet Nam', Presentation at ASEAN Energy & Utilities Digital Week, 7 July. [https://asew-expo.com/AEUDW2021/download/ASEAN-Electric-Vehicle-Outlook/Session2/Dr LE ANH Tuan.pdf](https://asew-expo.com/AEUDW2021/download/ASEAN-Electric-Vehicle-Outlook/Session2/Dr%20LE%20ANH%20Tuan.pdf)

- **Current Status of EV Charging Infrastructure**

Despite the absence of a national policy target for EV charging infrastructure development, VinFast is steadily increasing the charging stations. It is reported that over 8,000 charging ports at nearly 500 charging stations had been installed by the end of July 2021. VinFast's Phase 1 deployment plan was 40,000 charging ports at 2,000 charging stations nationwide.

Vinfast is also tying up with Petrolimix to set up a network of charging networks, especially electric two-wheelers battery swapping/renting stations. In addition, VinFast has also announced that it will operate Vinbus services in five large cities with e-buses produced by VinFast (Vietnamnet, 2021; Ucarshop, 2021).

- **Costs Associated with Vehicle Purchase (Value Added Tax, Excise Fee, Registration Fee)**

The Vietnamese government has implemented some taxes and levies associated with the purchase of vehicles. They are value added tax (VAT), excise tax (special consumption tax), and car registration fee.

**Value Added Tax**

Vehicles are subject to a standard VAT rate of 10%.

**Excise Tax**

Since the introduction of the excise tax law in 1998, there have been some changes in the applicable excise tax rates. The 2014 law introduced the differentiation by engine cylinder capacity and power source (Table 1.23).

**Table 1.23. 2014 Excise Tax**

Source Type	Class	Excise Tax Rate
Combustion Engine (<9 seats)	<2L	45%
	2L–3L	50%
	3L<	60%
Hybrids	(fuel consumption no more than 70%)	70% of above applicable rates
Bio-Diesel		50% of the above applicable rates
Electric Vehicle		25%

L = litre.

Source: Policies to Promote EV Development in Viet Nam. (A presentation slide at the study meeting on 28 February 2022, Central Institute for Economic Management).

The 2016 law reduced the tax rates with a smaller capacity of the engine, with higher tax rates for bigger capacity engines (Table 1.24).

**Table 1.24. 2016 Excise Tax**

Source Type	Class	Excise Tax Rate
Combustion Engine (<9 seats)	<1.5L	35%
	1.5L–2.0L	40%
	2.0L–2.5L	50%
	2.5L–3.0L	60%
Hybrids	(fuel consumption no more than 70%)	70% of the above applicable rates
Bio-Diesel		50% of the above applicable rates
Electric Vehicle	Passenger cars	15%
	Passengers and goods	10%

L = litre.

Source: Policies to Promote EV Development in Viet Nam. (A presentation slide at the study meeting on 28 February 2022, Central Institute for Economic Management).

In Excise Tax 2022 Law, tax rates on battery-powered EVs were lowered, especially from March 2022 to February 2027 (Table 1.25).

**Table 1.25. 2022 Excise Tax**

Source Type	Seats	Excise Tax Rate
Electric Vehicle	<9 seats	3% (March 2027:11%)
	10–16 seats	2% (March 2027: 7%)
	16–24 seats	1% (March 2027: 4%)
	Passengers and goods	2% (March 2027: 7%)

Source: Policies to Promote EV Development in Viet Nam (A presentation slide at the study meeting on 28 February 2022, Central Institute for Economic Management).

### Registration Fee

Vehicle registration fees are applicable by local municipals, and they may vary by region (Table 1.26).



**Table 1.26. Registration Fee**

<b>Municipal</b>	<b>Fee</b>	<b>EV</b>
Ha Noi	12%	0%: Mar 2022-Feb 2025
Ha Tinh	11%	50% of applicable fee: Mar 2025-
Others	10%	

Source: Policies to Promote EV Development in Viet Nam. (A presentation slide at the study meeting on 28 February 2022, Central Institute for Economic Management)

- **Economic Incentives for xEV Owners**

The Vietnamese government has not introduced economic incentives for individual owners, but there is an incentive for public bus operators to invest in clean energy buses and depots, which is applicable to general clean energy buses and depots including bio-fuel buses and compressed natural gas buses.

Bus operators can be exempted from import duty on domestically unavailable parts and components for the manufacture and assembly of vehicles. Registration fees are also exempted for clean-energy buses. Public bus authorities are set a lower excise tax. Bus operators may receive the support of provincial or central government for loan interest rates. Depending on local resources, the provincial government will promulgate specific regulations for the procurement of new vehicles. According to Resolution No. 07/2019/NQ-HDND of Ha Noi, for example, the city budget will support 50% of the loan interest rate in the first 5-year period of investment in clean energy buses.

- **Economic Incentives for Charging Infrastructure Development**

There are no dedicated incentives for the development of charging infrastructure. There are a few economic incentives for public bus operators' infrastructure investment, not limited to EV charging stations, but including refuelling stations for engine-powered buses. Bus operators may be eligible to access preferred loans, including official development assistance loans and preferred credit loans. Some local governments may provide loan interest subsidies. For example, Ha Noi City subsidises 50% of loan interest for the first 5 years of investment.

- **Economic Incentives for Manufacturers**

By Decree 57/2020/ND-CP, a preferential import tax rate of 0% will be levied on raw materials and accessories that have not been domestically produced before manufacturers' domestic assembly. Note that this decree applies to general automobile materials and accessories, not limited to electric vehicles.

Manufacturers may need to sign up for this tax incentive programme. From the 3rd year, at least 125 vehicles are required to be produced, however, there is no specific target in terms of the ratio of EVs out of total new car sales.

- **User/Driver Management**

Since the early 2010s, there has been growth in electric two-wheels in Viet Nam, especially e-bikes. Many students chose e-bikes with a preference for flexibility, convenience, and cheaper costs.

Road Traffic Law (No.23/2008/QH12) does not require a driving test or a driving licence for riding e-bikes. This allows large numbers of riders using e-bikes for daily travel, especially the younger generations. The Viet Nam government amended Road Traffic Law to classify driving licences for motorised two- and three-wheelers into three categories: A1, A2, and A3, which was subsequently regrouped into four categories: A0, A2, A, and B1.

- **EV Battery Production Plan, EV Criteria**

The Vietnamese government has not enacted a manufacturing plan for EV batteries and EV standards.

- **Battery Reuse Plan**

The Vietnamese government has not enacted an EV battery reuse plan.

- **VRE Introduction Plan**

According to the Vietnamese government's 8th Power Development Plan, renewable energy will account for 29% of the capacity of power generation facilities by 2030.

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