Verification Report

for

KPI 2 of Kingdom of Thailand's Sustainability-Linked Bond Indexed to Annual Registrations of Zero Emission Vehicle (ZEV) Passenger Cars and Pick-Up Trucks in 2025

United Nations Development Programme (UNDP)

May 2026

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The Verification Report is the result of a collaborative process involving UNDP staff, consultants, and academic experts from the National Energy Technology Center (ENTEC).

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1 Introduction

The Public Debt Management Office (PDMO) has requested United Nations Development Programme (UNDP) to fulfill the role of external verifier of the key performance indicator 2 (KPI 2) of the KOT Sustainability-Linked Financing Framework [1] (hereinafter referred to as the Framework) published in October 2024. KPI 2 is on annual registrations of Zero Emission Vehicle (ZEV) passenger cars and pick-up trucks that is linked to Thailand's 30@30 policy, which entails that 30% of the vehicles produced within Thailand will be ZEVs by 2030 and includes sub-targets of ZEV manufacturing and utilization.

During February to May 2026, UNDP has carried out the verification process of KPI 2 presented in the 2025 KOT Sustainability-Linked Bond Progress Report (hereinafter referred to as the 2025 SLB Progress Report) dated June 2026 and calculated on the basis of the data from the Department of Land Transport (DLT) website[2].

The 2025 SLB Progress Report and the data from the DLT website were prepared and provided to UNDP by the Government of KOT between February and May 2026, according to schedule.

The Government of KOT warrants to UNDP the accuracy, integrity, quality, reliability and completeness of all technical data, files, documents, KPI value calculations and technical records, as well as any other data and materials made available to UNDP for the purpose of this verification report.

2 Scope of Verification

The verification is carried out for the key performance indicator 2 (KPI 2) of the KOT Sustainability-Linked Financing Framework published in October 2024 and reported in the 2025 SLB Progress Report dated June 2026 prepared by the Government of KOT:

KPI 2: Annual registrations of Zero Emission Vehicle (ZEV) passenger cars and pick-up trucks

SPT 2: Increase annual registrations of ZEV passenger cars and pick-up trucks by 476% by 2030, equivalent to 440,000 passenger cars and pick-up trucks

For the compilation of this KPI, the ZEV annual registration data has been derived and consolidated from the raw data disclosed on DLT website[2] and cross-checked against the information disclosed on the Thailand Automotive Institute (TAI) website[3].

The scope of verification includes the performance of KPI 2 against SPT 2, the implementation status of the policy measures stated in the Framework with regards to KPI 2, and the alignment of the trajectory of KPI 2 with the one stated in the Framework.

[1] PDMO (2024), Sustainability-Linked Financing Framework https://backend.pdmo.go.th/uploads/documents/2024/Oct/PDMO%20SLB%20Framework_Final.pdf
[2] DLT (2026), Transport Statistics Division https://web.dlt.go.th/statistics/
[3] TAI (2026), Thai Automotive Industry Statistics https://data.thaiauto.or.th/

There is no verification of KPI 1 since the performance of KPI 1 was reviewed and verified as part of the NDC process performed by the team of technical experts of the UNFCCC via the International Consultation and Analysis process.

3 Verification Methodology

The technical review of the annual registrations of ZEV passenger cars and pick-up trucks under the Motor Vehicle Act in 2025 is conducted, with specific conclusions on:

- Adherence to relevant international principles, guidelines, and standards, including TACCC principles set forth in the Good Practice Guidance incorporated in the 2006 IPCC Guidelines[4], namely principles of transparency, accuracy, completeness, consistency, and comparability; Global Investors for Sustainable Development (GISD) Guidance on Sovereign SDG Bonds for Countries and Investors[5]; International Financial Reporting Standards (IFRS) S2: Climate-related Disclosures[6]; Sectoral Decarbonization Approach (SDA) of Science Based Targets Initiative[7]; and Sustainability Accounting Standards Board (SASB) Sector Standards[8];
- Compliance of the term passenger cars and pick-up trucks under the Motor Vehicle Act B.E. 2522[9] and the term Zero Emission Vehicle (ZEV) with international and national practices[10,11,12,13,14];
- Validity of the compiled data sets from DLT website to represent the baseline annual registrations in 2023 and the target annual registrations in 2025;
- Quality of data collection and reporting in accordance with the United Nations' Toolkit for Quality Assessment of Administrative Data for Official Statistics[15], covering completeness, uniqueness, and validity;

[4] IPCC (2006), 2006 IPCC Guidelines for National Greenhouse Gas Inventories https://www.ipcc.ch/report/2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/
[5] GISD (2024), Guidance on Sovereign SDG Bonds for Countries and Investors https://gisdalliance.org/sites/default/files/2024-04/GISD%20Alliance%20Guidance%20on%20Sovereign%20SDG%20Bonds-FINAL.pdf
[6] IFRS Foundation (2026), IFRS S2 Climate-related Disclosures https://www.ifrs.org/issued-standards/ifrs-sustainability-standards-navigator/ifrs-s2-climate-related-disclosures/
[7] CDP, WRI & WFF (2015), Sectoral Decarbonization Approach (SDA): A Method for Setting Corporate Emission Reduction Targets in line with Climate Science https://files.sciencebasedtargets.org/production/files/Sectoral-Decarbonization-Approach-Report.pdf
[8] IFRS Foundation (2023), Sustainability Accounting Standards Board (SASB) Sector Standards: Road Transportation
[9] DLT (1979), Motor Vehicle Act B.E. 2522 https://www.dlt.go.th/th/dlt-knowledge/114
[10] European Union (2018), Regulation (EU) 2018/858 https://eur-lex.europa.eu/eli/reg/2018/858/oj/eng
[11] European Union (2013), Regulation (EU) 168/2013 https://eur-lex.europa.eu/eli/reg/2013/168/oj/eng
[12] European Union (2021), Regulation (EU) 2021/2139 https://eur-lex.europa.eu/eli/reg_del/2021/2139/oj/eng
[13] ASEAN Taxonomy Board (2024), ASEAN Taxonomy for Sustainable Finance https://asean.org/book/asean-taxonomy-for-sustainable-finance-version-3/
[14] Thailand Taxonomy Board (2023), Thailand Taxonomy Phase I https://www.bot.or.th/en/financial-innovation/sustainable-finance/green/Thailand-Taxonomy.html
[15] Available at: https://data.unwomen.org/sites/default/files/documents/Publications/2023/ESA-admin-data-toolkit.pdf

- implementation status of key policy measures contributing to increase in annual registrations of ZEV passenger cars and pick-up trucks;
- Strategic recommendations on possible policy measures to accelerate growth in annual registrations of ZEV passenger cars and pickup trucks.

4 Declaration of Competence and Independence

The verification activities were carried out between February and May 2026 by a qualified, multidisciplinary team of UNDP experts with good knowledge and experience in SLB and low carbon transport.

The verification fulfilled the requirements of independence, impartiality and other ethical requirements established in the UNDP Code of Ethics, which is based on the principles of integrity, accountability, transparency, professionalism, mutual respect and results orientation.

5 Activities Performed

The technical review of KPI 2 was conducted based on the 2025 SLB Progress Report and the data on registrations of ZEV passenger cars and pick-up trucks under the Motor Vehicle Act from the DLT website provided by PDMO.

The adherence of KPI 2 in the 2025 SLB Progress Report to relevant international principles, guidelines, and standards was confirmed. The compliance of the terms used to define KPI 2 was reviewed against international practices. The data of annual registrations of ZEV passenger cars and pick-up trucks under the Motor Vehicle Act in the 2025 SLB Progress Report were reviewed and cross-checked against the information disclosed on DLT and TAI websites. The quality of data collection and reporting of data on DLT website was assessed using the United Nations' Toolkit for Quality Assessment of Administrative Data.

Trajectories of annual and monthly registrations of ZEV passenger cars and pick-up trucks under the Motor Vehicle Act were developed to evaluate the prospect to achieve increase in annual registrations of ZEV passenger cars and pick-up trucks by 476% by 2030.

Finally, implementation status of key policy measures contributing to increase in annual registrations of ZEV passenger cars and pick-up trucks were confirmed through consultations with relevant government agencies, including Excise Department (ED), Office of Industrial Economics (OIE), Department of Land Transport (DLT), and The Federation of Thai Industries (FTI), from which strategic recommendations on possible policy measures to accelerate growth in annual registrations of ZEV passenger cars and pickup trucks were synthesized and summarized.

6 Verification Results

KPI 2's adherence to following international principles, guidelines, and standards are confirmed. **TACCC principles** are used to assure that the process associated with KPI 2 is transparent, accurate, consistent, comparable, and complete. **GISD Alliance Guidance on Sovereign SDG Bonds** ensures that government finance is utilized for activities contributing to sustainable development. **International Financial Reporting Standards (IFRS) S2: Climate-related Disclosures** requires entities to disclose use of resource, and corresponding activities to achieve climate goals, and reveal climate-related information on challenges and opportunities to benefit users of the finance report. **Sectoral Decarbonization Approach (SDA)** guides activities to align with strategies to reduce greenhouse gas emissions in accordance with set goals. **Sustainability Accounting Standards Board (SASB) Sector Standards** outlines standards for short- and long-term strategies to response to emission scopes.

Details of adherence of KPI 2 to international principles, guidelines, and standards are as follows.

- KPI 2 complies with **TACCC principles** which are good practice guidance of the 2006 IPCC Guidelines. It complies with the principle of **transparency** as the definition of KPI 2 along with the data source are clearly documented and the cross-calculation can be easily conducted. It complies with the principle of **accuracy** as it directly adopts the data sets available on DLT website which are automatically gathered through the online registration system from provincial offices. It complies with the principle of **consistency** as all annual registration data sets are based on newly registered vehicles on DLT website. KPI 2 generally complies with the principle of **comparability** as annual registrations are basically represented by newly registered vehicles. While DLT website also includes the data sets of first registered vehicles which do not include vehicle re-registration and may better represent annual new registrations, the values are generally comparable to the newly registered vehicles, and they are not used by common users. Finally, KPI 2 complies with the principle of **completeness** since the annual registration data is sourced from government records which are based on mandatory reports by the registrants.
- KPI 2 principally adheres to **GISD Alliance Guidance on Sovereign SDG Bonds** as it is aligned with SDG 9 Industry, Innovation and Infrastructure and SDG 11 Sustainable Cities and Communities. Although the KPI is not directly aligned with the Nationally Determined Contributions (NDCs), it serves as a foundation for emission reduction in the transport sector, ensuring the alignment with existing NDC commitments.
- KPI 2 adheres to **International Financial Reporting Standards (IFRS) S2: Climate-related Disclosures** as 2025 SLB Progress Report discloses information that helps understand the progress towards climate-related targets. 2025 SLB Progress Report discloses statistics of ZEV adoption and supporting policy measures which could account for significant reduction of greenhouse gas emissions.
- KPI 2 primarily adheres to **Sectoral Decarbonization Approach (SDA)** as the promotion of ZEVs aligns with the **"improve"** strategy which is among the three strategies to attain the emission reduction target for light-duty road passenger transport: avoid, shift and

improve. The adoption of ZEVs to replace internal combustion engine vehicles offers higher efficiency and significantly contributes to GHG emission reduction.

- KPI 2 adheres to **Sustainability Accounting Standards Board (SASB) Sector Standards** as it aligns with TR-RO-110a.2. discussion of long- and short-term strategy or plan to manage Scope 1 emissions. Increasing the number of ZEVs is a strategic move towards Scope 1 emission reduction in the transport sector.

The term passenger cars and pick-up trucks under the Motor Vehicle Act B.E. 2522 and the term Zero Emission Vehicle (ZEV) used to define KPI 2 comply with international and national practices.

- The term passenger cars and pick-up trucks under the Motor Vehicle Act B.E. 2522 covers RY. 1, RY. 5, RY. 6, RY. 9, RY. 10, and RY. 11, which generally align with vehicle categories M1, M2, and N1 under **EU Regulation 2018/858**. RY. 1 also encompass certain L7e vehicles (heavy quadricycles) under **EU Regulation 168/2013**.
- The term Zero Emission Vehicle (ZEV) is in the category of substantial contribution to climate change mitigation for vehicles under categories M1, M2, N1, and L under **EU Taxonomy** or EU Regulation 2021/2139 as its direct CO_2 emissions are zero.
- The term Zero Emission Vehicle (ZEV) also complies with technical screening criteria of Tier 1 (Green) for vehicles under categories M, N, and L of **ASEAN Taxonomy for Sustainable Finance** as its direct CO_2 emissions are zero.
- Finally, the term Zero Emission Vehicle (ZEV) complies with criteria of Green category for passenger cars and freight transport operations by road of **Thailand taxonomy** as its direct (tailpipe) CO_2 emissions are zero.

The baseline annual registrations of Zero Emission Vehicles (ZEV) passenger cars and pick-up trucks in 2023 were compiled from the 2023 annual data sets of battery electric vehicles and fuel cell electric vehicles under the **newly registered vehicles** in the previous DLT website. The annual registrations in 2025 are compiled from the 2025 annual data sets of battery electric vehicles and fuel cell electric vehicles under the **statistics for vehicle registrations** in the current DLT website. This is due to the revision in terminology during DLT website renewal, from **newly registered vehicles** to **statistics for vehicle registrations,** to better align with the corresponding legal definitions. The underlying statistical methodology and the compiled data sets remain unchanged.

The vehicle registrations include vehicles previously registered under Land Transport Act B.E. 2522 and re-registered under the Motor Vehicle Act B.E. 2522, but do not include EV conversions. However, the total number of these vehicles is less than 0.1% of the total ZEV passenger cars and pick-up trucks and has negligible effects on the results. When crosschecked with the data sets from the website of TAI which were compiled from a voluntary report by the vendors, the discrepancies were negligible, i.e., less than 0.1% of the total number.

In terms of quality of annual registration data compiled from DLT website, statistical system and institutional framework, input data, data processing, and statistical outputs generally comply with **UN Toolkit for Quality Assessment of Administrative Data for Official Statistics** in all dimensions: completeness, uniqueness, and validity.

- As for **completeness**, the source data of the annual registrations, newly registered vehicles, covers all types of registrations under the Motor Vehicle Act B.E. 2522 in a year, except for EV conversion of which the number is currently statistically insignificant.
- As for **uniqueness**, the data is automatically pulled from the mandatory registration at each DLT provincial office to the central system and the serial number which is unique to each vehicle is used to avoid double counting. In addition, the data is rechecked and verified before being uploaded to the DLT website. Therefore, all data points are traceable.
- After the digitalization of the statistical system well before the collection of the baseline data set, the format and the type of annual registration data has always been consistent, ensuring the **validity** of all data sets used for KPI 2.

The achievement of KPI 2 against SPI 2 is supported by several key policy measures directly and indirectly contributing to increase in annual registrations of ZEV passenger cars and pick-up trucks. The following policy measures serve as key strategies to drive the adoption of ZEVs, and their implementation status were confirmed.

- **EV 3.5** follows the measures under EV 3.0, though the subsidy for EV purchase decreased, and the reductions of excise tax and import duty are smaller[16]. EV Board also introduced additional flexibility measures to moderate local production requirements[17]. While the monthly registration has continuously increased since 2024, the end of EV 3.5 which ends the direct ZEV purchase subsidy may result in reduced growth of ZEV annual registration in the long run.
- **New vehicle excise tax structure** incorporates requirements for local contents and advanced driver assistance systems (ADAS), while still maintaining its focus on CO_2 emission reduction[18]. Appropriate differentiation of tax rates based on CO_2 emissions encourage the transition toward ZEVs, and incorporation of local content conditions and ADAS requirements will support sustainable transition of Thailand's automotive industry.
- **Carbon tax** was introduced for all fossil fuels in early 2025 to raise public awareness[19]. Thai Government plans gradually increase the unit carbon tax to further support CO_2 emission reduction in transport sector.

[16] Thailand Board of Investment (2023), EV Board Gives the Green Light to EV 3.5 Package, Positioning Thailand as the Key Regional Hub for Electric Vehicle Manufacturing
https://www.boi.go.th/index.php?page=press_releases_detail&topic_id=134676
[17] Thailand Board of Investment (2025), Thailand EV Board Adjusts EV3, EV3.5 Terms to Promote Exports as Investment in EV Supply Chain Tops 137 Billion Baht
https://www.boi.go.th/index.php?page=press_releases_detail&topic_id=137207
[18] SAIC Motor-CP (MG) (2025), The New Excise Tax 2026 Readiness Automotive Tax Structure
[19] Excise Department (2025), Excise Department Notice on Criteria and Conditions for Carbon Pricing of Oil Commodities and Oil Products
https://lawelcs.excise.go.th/lawdetail?id=8985

- Some financial institutions in Thailand have started introducing **soft loan for electrified vehicles**[20]. It can improve accessibility to vehicle financing, particularly following the gradual reduction of direct EV subsidies in recent years.
- The number of **EV DC charging outlets** has already outperformed the targets set by EV Board[21,22]. However, with the concentration of charging outlets in city area[23], a long journey with a ZEV remains a challenge. On the other hand, home chargers and charging facilities in multi-unit properties are becoming increasingly common, while the latter still faces regulatory complications.
- KOT Government is currently developing **the old car for new car scheme** to encourage owners of old vehicles to permanently retire eligible vehicles and replace them with newer low-emission vehicles through financial incentives or tax benefits[24]. However, the scheme is not exclusively designed for ZEVs and has not yet been officially approved.
- Thailand aims to maintain its position as a major global automotive manufacturing hub under the **70@30 policy framework**[25]. This framework ensures the survival of automotive and auto parts industries along the transition towards low-carbon transport.
- KOT Government enforces end-of-life management of EV batteries and EVs through **extended producer responsibility (EPR)** approach, under which vehicle manufacturers and importers are expected to take responsibility for collection, reuse, recycling, and proper disposal of batteries and vehicles[26].

Since the share of ZEV in Thailand has surpassed the tipping point[27] where a new technology becomes a common option in the market. The next step is to prepare the ZEV ecosystem to maintain the competitiveness of the technology in the market. Strategic recommendations on possible policy measures to accelerate growth in annual registrations of ZEV passenger cars and pickup trucks were synthesized and summarized as follows.

- Policy actions should be taken to facilitate the purchase of a new ZEV, starting with the encouragement of publication of comparative **total cost of ownership (TCO)** of ZEV and other vehicle types, that include the total cost of the entire lifetime of the vehicles to show the advantage in lower operating and maintenance costs of ZEVs. **Partial subsidization or discount ZEV insurance cost** and setting standard insurance coverage will ensure that the operation cost remains low. **Dedicated soft loans for ZEVs** with lower interest rates will ease the decision making on replacement of old ICE vehicles with ZEVs. And

[20] Government Savings Bank (2026), Soft Loan GSB https://www.gsb.or.th/news/gsbpr14-69/
[21] EVAT (2026), Number of Electric Vehicle Charging Stations in Thailand https://evat.or.th/wp-content/uploads/2026/04/EVAT01_Charging-Station-2026_Jan.pdf
[22] EPPO (2021), Direction for Electric Vehicle Promotion https://www.eppo.go.th/index.php/en/component/k2/item/17415-ev-charging-
[23] EVAT (2026), Thailand EVSE Map https://evsemap.evat.or.th/
[24] The Government Public Relations Department (2026), Old car for new car scheme https://radiothailand.prd.go.th/th/content/category/detail/id/57/iid/498091
[25] Auto Parts Industry Club, The Federation of Thai Industries (2025)
[26] Department of Industrial Works (2025), Analysis Report on Impact from the Act, Draft Industrial Waste Management Act https://www.diw.go.th/webdiw/wp-content/uploads/2025/08/a04082568-02.pdf
[27] BOI (2026), Thailand's supercharged EV sales poised for a new surge: Automakers lured by government policies tilt the global balance towards electric vehicles https://www.boi.go.th/en/advertorial16

finally, policy measures that can accelerate the **removal of old vehicles from the ecosystem** should be encouraged, e.g., the old car for new car scheme, increase in annual vehicle tax for old cars and high-emission cars.

- Policy measures must also be designed to address the concerns of potential ZEV buyers. **Promotion of ZEV urban use** is possible through encouragement of home charging or facilitation of cumbersome approvals required for installation of charging outlets in multi-unit properties. In the longer term, incentives to induce installation of charging stations in sparsely populated areas will also be needed to balance out the **distribution of ZEV charging infrastructure**. **Assurance of high standard of battery safety** along with **awareness raising campaign** to ensure public trust on the safe use of EV batteries and to advise actions to be taken during fire or explosive events will help ease public anxiety.
- Policy measures that strengthen the wider ecosystem to maintain the competitiveness of Thai automotive industry are also needed. **Investment in R&D and human capital development** have proved to be efficient in building the foundation for the sustained growth of the industry. **Technical cooperation with exporting countries** will ensure the retention of technical capability of the industry amidst the transition towards electrified vehicles. Finally, **holistic approach** needs to be taken to judge the best combination of policy measures. ZEV promotion is only a single dimension of the transition towards low-carbon transport, and the policy measures must be designed with the considerations of all key aspects. Survival of the automotive and auto parts industries should be taken into account, and the well-to-wheel and wheel-to-tank emissions should be used to evaluate contributions of the policy measures.

7 Conclusions

The KOT government submitted the 2025 KOT Sustainability-Linked Bond Progress Report, complying with the frequency established in KOT Sustainability-Linked Financing Framework. In UNDP’s opinion, KPI 2 reported in the 2025 KOT Sustainability-Linked Bond Progress Report has been prepared in accordance with the methodology established in KOT Sustainability-Linked Financing Framework.

KPI 2 adheres to relevant international principles, guidelines, and standards, and terms used for KPI 2 generally comply with international practices. Data sets compiled from DLT website represent the baseline annual registrations in 2023 and the target annual registrations in 2025, and the data quality is in accordance with international practices. While it may be premature to definitively conclude that the annual registration trajectory is fully on track, the monthly registration data indicates an upward trend. Policy contributing to increase in annual registrations of ZEV passenger cars and pick-up trucks are in place and appear effective.

For UNDP

Naimh Collier-Smith
UNDP Resident Representative in Thailand
Bangkok, June 24, 2026

Technical Review Report

for

KPI 2 of Kingdom of Thailand’s Sustainability-Linked Bond Indexed to Annual Registrations of Zero Emission Vehicle (ZEV) Passenger Cars and Pick-Up Trucks in 2025

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1 Introduction

This technical review explains the scope and methodology employed to verify performance of KPI 2 against SPT 2, and assessments which are designed to follow the scope and methodology. It elaborates important information compiled to support verification of KPI 2. It also discusses policy measures and strategies towards the achievement of KPI 2 against SPT 2.

This technical review contains two main sections including scope and methodology, and results. The former explains the adopted approaches for the verification, while the latter presents results of reviews and assessments for the verification of KPI 2 against SPT 2. Two sections share similarity in structure, comprising adherence to relevant international principles, guidelines, and standards; compliance of the definitions with international practices; validity of the complied data set; quality of data collection and processing; and prospect of the trajectory of KPI 2 against SPT 2; and implementation status of policy measures towards 30@30 policy and other policy measures relevant to KPI 2.

2 Scope and Methodology

The verification includes the performance of KPI 2 against SPT 2, the implementation status of the policy measures stated in the Framework with regards to KPI 2, and the alignment of the trajectory of KPI 2 with the one stated in the Framework. In order to verify the performance of KPI 2, zero emission vehicle (ZEV) annual registration data has been derived and consolidated from the raw data disclosed on DLT website and statistically cross-checked against the information disclosed on the Thailand Automotive Institute (TAI) website.

With regard to the verification of KPI 2 against SPT 2, annual registrations of ZEV passenger cars and pick-up trucks under the Motor Vehicle Act are utilized. Additionally, statistical trends of monthly registration of ZEV passenger cars and pick-up trucks in 2025 are gathered and statistically analyzed to confirm trajectory against attainment of SPT 2: increase annual registrations of ZEV passenger cars and pick-up trucks by 476% by 2030, equivalent to 440,000 passenger cars and pick-up trucks.

With regard to the verification of the implementation status of the policy measures, policy measures stated in the Framework and the 2025 SLB Progress Report, particularly, policy measures to achieve the targets under 30@30 policy, electric vehicle promotion policies, and policies to prepare supporting infrastructure and ecosystem are analyzed.

2.1 Adherence to relevant international principles, guidelines, and standards

Verification of the adherence of KPI 2 to relevant international principles, guidelines, and standards is designed to examine international documents, including TACCC principles incorporated in the Good Practice Guidance incorporated in the 2006 IPCC Guidelines, Global Investors for Sustainable Development (GISD) Guidance on Sovereign SDG Bonds for Countries and Investors, International Financial Reporting Standards (IFRS) S2: Climate-related Disclosures, Sectoral Decarbonization Approach (SDA), and Sustainability Accounting Standards Board (SASB) Sector Standards.

TACCC Principles provide crucial guidance to ensure rigorous and robust practice for national inventory, ascertaining data quality and usefulness. The principles, including transparency, accuracy, consistency, comparability, and completeness, are the core part of the 2006 IPCC Guidelines.

GISD Guidance on Sovereign SDG Bonds introduces principles to guide bond issuers, investors, and relevant stakeholders in achieving United Nations' Sustainable Development Goals (SDGs).

International Financial Reporting Standards (IFRS) S2: Climate-related Disclosures require entities to disclose information about climate-related risks and opportunities that benefit users of financial reports in making decisions.

SDA of Science Based Targets Initiative is promoted to be a method for setting greenhouse gas emission reduction targets with climate science basis, in which the target aligns with the Paris Agreement's to limit global warming to 2°C above pre-industrial level.

SASB Sector Standards guides entities to disclose sectoral information regarding sustainability-related risks and opportunities.

2.2 Compliance of definitions with international practices

Classifications of passenger cars and pick-up truck in Thai and international standards are first investigated. Classifications of passenger cars and pick-up trucks under the Motor Vehicle Act B.E. 2522 were compared with vehicle categories under EU Regulation 2018/828 and EU Regulation 168/2013.

The definition of ZEV is finally confirmed against EU Taxonomy or the Commission Delegated Regulation (EU) 2021/2139, ASEAN Taxonomy for Sustainable Finance, and Thailand Taxonomy to identify the level of contribution to greenhouse gas emission reduction.

2.3 Validity of the complied data set

For the validation of data sets for annual registrations of ZEV passenger cars and pickup trucks, two data sets, including statistics for vehicle registrations and statistics for new vehicle registrations, were examined in detail according to information in the Land Transport Act. The suitable date set was selected to be utilized for the verification.

In order to ensure the validity of the date sets on annual registrations disclosed on the Department of Land Transport (DLT) website, the data sets were cross-checked with information disclosed on the Thailand Automotive Institute (TAI) website.

2.4 Quality of data collection and processing

Quality of data collection, processing, and reporting is confirmed against the United Nations' Toolkit for Quality Assessment of Administrative Data for Official Statistics. The Toolkit covers major statistical data elements, including statistical system and institutional environment, input/source data, data processing, and statistical output. Three dimensions to assess the quality of the four elements include completeness, uniqueness, and validity. The Toolkit is perceived as a tool to assist in carrying out quality assessment of administrative data for official statistics.

2.5 Prospect of the trajectory of KPI 2 against SPT 2

Prospect of the trajectory of KPI 2 against SPT 2 is assessed using information disclosed on DLT website. The trend of historical data is investigated based on monthly registration in 2025, and linear extrapolation of the said historical registration.

Confirmation of statistical values obtained from DLT website ensures traceability of data on annual registrations. Investigation on trends of historical data of monthly registration helps explore purchase behavior according to important events in relation to EV promotion. Linear extrapolation of historical registrations predicts future trend of EV registrations against SPT 2.

2.6 Implementation status of policy measures

The achievement of KPI 2 against SPI 2 is supported by several key policy measures directly and indirectly contributing to increase in annual registrations of ZEV passenger cars and pick-up trucks. This report reviews implementation status of such policy measures. The reviews include the following policy measures:

- EV 3.0 and EV 3.5 incentive packages;
- Thailand's new excise tax structure;
- Carbon tax;
- Soft loan for electrified vehicles;
- Promotion of electric vehicle charging outlets;
- Old car for new car scheme;
- 70@30 policy framework and transformation of auto parts suppliers;
- Improving ZEV supply chain.

2.7 Possible policy measures to accelerate growth in annual registrations of ZEV passenger cars and pickup trucks

Based on reviews of international best practices, inputs from stakeholder interviews and multi-stakeholder consultation, strategic recommendations on possible policy measures to accelerate growth in annual registrations of ZEV passenger cars and pickup trucks were synthesized and summarized.

3 Results

3.1 Adherence to relevant international principles, guidelines, and standards

The TACCC Principles were introduced as good practice guidance and later integrated into the IPCC Guidelines to ensure the accuracy of estimated GHG inventories and to establish a systematic approach for conducting national inventory estimation. While the principles are based on the practices for the estimation of GHG emissions, they are deemed applicable to KPI 2 estimation against SPT 2 as they are meant to contribute to GHG emission reduction in the transport sector. The adherence to each principle can be confirmed as follows[1]:

1. **Transparency**: Assumptions and methodologies must be clearly explained and documented to facilitate replication and assessment. As KPI 2 and SPT 2 are based on the publicly available annual registration data on the Department of Land Transport (DLT) website, where the definitions are clearly documented and the cross-calculation can be easily conducted, the practice adopted to confirm the fulfillment of KPI 2 against SPT 2 is transparent.
2. **Accuracy**: A relative measure of the exactness of the estimates, ensuring that calculations are neither systematically over- nor underestimated, based on the best available data and information. The annual registration data available on DLT website is based on the online registration system, to which the data is gathered from provincial land transport offices. Therefore, it can be assumed that the annual registration data on the website is highly accurate.
3. **Consistency**: The estimates must be internally consistent across all their elements and with the estimates from previous years. The same methodologies should be applied to both the base year and all subsequent years, ensuring uniformity in data sets. The annual registration data used for KPI 2 and SPT 2 is based on statistics for vehicle registrations for both the base year (2023) and the subsequent year (2025), showing the consistency of the approach.
4. **Comparability**: The estimates must be comparable among Parties, adhering to globally recognized methodologies and formats. Annual registrations are generally represented by the statistics for vehicle registrations. However, the statistics for vehicle registrations under the Motor Vehicle Act B.E. 2522 include vehicle re-registration when changed from and to the Motor Vehicle Act B.E. 2522 and the Land Transport Act B.E. 2522. While the DLT website also shows the statistics for new vehicle registrations which do not include such vehicles, the data is not commonly known and is not used by common users. In addition, both data sets do not include EV conversions, i.e., conversion from internal combustion engine vehicles to electric vehicles. However, given the consistency with the base year and the fact that the number of re-registrations and the number of EV conversions are currently very small (both less than 0.1%), the statistics for vehicle registrations can continue to be used as the source of data for KPI 2 and SPT 2.

[1] IPCC (2006) 2006 IPCC Guidelines for National Greenhouse Gas Inventories https://www.ipcc.ch/report/2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/

5. **Completeness**: The estimates must be reported for all relevant categories. Since the annual registration data is sourced from government records which are based on mandatory reports by the registrants, the data sets used for the estimation of KPI 2 against SPT 2 are considered complete.

GISD Alliance Guidance on Sovereign SDG Bonds provides a set of principles and recommendations to guide sovereign bond issuers, investors, and other stakeholders in supporting the United Nations' Sustainable Development Goals (SDGs) through sovereign debt issuance. Sovereign SDG bonds are instruments issued by governments to finance projects that contribute to the SDGs, such as poverty reduction, climate action, and sustainable infrastructure.

KPI 2 is aligned with SDG 9 and SDG 11 as detailed as follows.

1. **SDG 9 Industry, Innovation and Infrastructure**: The attainment of KPI 2 contributes to the acceleration in adoption of electric vehicles, which is a part of the ambition to develop quality, reliable, sustainable and resilient infrastructure.
2. **SDG 11 Sustainable Cities and Communities (11.2)**: The fulfillment of KPI 2 contributes to the provision of access for people in cities and communities to sustainable transport systems.

Although the KPI is not directly aligned with the NDC which is another essential target that the sovereign SDG bonds should aim to fulfill, it serves as a foundation for emission reduction in the transport sector, ensuring the alignment with existing NDC commitments. In addition, KPI 1 shows full alignment with the NDC and perfectly complement KPI 2.

International Financial Reporting Standards (IFRS) S2: Climate-related Disclosures[2] require entities to information about climate-related risks and opportunities including

1. **Climate-related risks to which the entity is exposed** – climate-related physical risks and climate-related transition risks.
2. **Climate-related opportunities available to the entity**
3. **Enabling understanding on**
    a. Governance processes, controls and procedures the entity uses to monitor, manage and oversee climate-related risks and opportunities;
    b. The entity's strategy for managing climate-related risks and opportunities;
    c. Processes the entity uses to identify, assess, prioritize and monitor climate-related risks and opportunities, including whether and how those processes are integrated into and inform the entity's overall risk management process; and
    d. The entity's performance in relation to climate-related risks and opportunities, including progress towards any climate-related targets it has set, and any targets it is required to meet by law or regulation.

[2] IFRS Foundation (2026), IFRS S2 Climate-related Disclosures https://www.ifrs.org/issued-standards/ifrs-sustainability-standards-navigator/ifrs-s2-climate-related-disclosures/

In this regard, KPI 2 aligns with (IFRS) S2 as it contributes to the progress towards climate-related targets it has set, i.e., annual registration of ZEV and policy measures to accelerate ZEV adoption against 2030 targets.

Sectoral Decarbonization Approach (SDA) introduced as a science-based method for those who aimed for setting greenhouse gas emission reduction targets necessary to stay within a 2°C temperature rise. The approach indicated sectors that have emission reduction potential to remain at the 2°C temperature rise. Light-duty road passenger transport is one of the indicated sectors where the strategies to attain the emission reduction target include:

1. **Avoid** – slows individual travel growth via city planning and demand management.
2. **Shift** – enables people and business to shift to more efficient modes, such as rail.
3. **Improve** – encourages the adoption of new technologies and fuels[3].

ZEVs primarily align with the "improve" strategy as they encourage the adoption of electricity-driven vehicles to replace those powered by internal combustion engines, offering higher efficiency and contributing significantly to GHG emission reduction.

Sustainability Accounting Standards Board (SASB) Sector Standards intended to guide entities in disclosing information regarding sustainability-related risks and opportunities. The standards determine which disclosure topics are relevant.

Regarding road transportation, the standards encourage entities to disclose the following information:

1. **TR-RO-110a.1.** Gross global Scope 1 emissions;
2. **TR-RO-110a.2.** Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets;
3. **TR-RO-1103.3.** (1) Total fuel consumed, (2) percentage natural gas and (3) percentage renewable.

In relation to these disclosures, KPI 2 aligns with TR-RO-110a.2, as it involves increasing the number of ZEV, a strategic move towards Scope 1 emission reduction in the transport sector. Furthermore, if the Measurement, Reporting, and Verification (MRV) scheme is adopted to ensure the linkage between the number of annual registrations and the emission reduction, KPI 2 will also fall under TR-RO-110a.1[4].

[3] Science Based Targets (2015), Sectoral Decarbonization Approach (SDA): A method for setting corporate emission reduction targets in line with climate science
[4] IFRS Foundation (2023), Sustainability Accounting Standards Board (SASB) Sector Standards: Road Transportation

3.2 Compliance of definitions with international practices

3.2.1 Passenger cars & pick-up trucks

Vehicles in Thailand are classified into 17 categories according to the Motor Vehicle Act B.E. 2522 taken charge by Department of Land Transport (DLT)[5], as detailed below.

RY. 1 Sedan
RY. 2 Microbus & passenger van
RY. 3 Van & pick-up
RY. 4 Motor-tricycle
RY. 5 Interprovincial taxi
RY. 6 Urban taxi
RY. 7 Fixed route taxi
RY. 8 Tuk Tuk
RY. 9 Hotel taxi
RY. 10 Tour taxi
RY. 11 Car for hire
RY. 12 Motorcycle
RY. 13 Tractor
RY. 14 Road roller
RY. 15 Farm vehicle
RY. 16 Automobile trailer
RY. 17 Public motorcycle

The verification of KPI 2 focuses on passenger cars and pick-up trucks, which covers eight specific categories of vehicles under the Motor Vehicle Act B.E. 2522, as follows.

[5] DLT (2026), Transport Statistics Division https://web.dlt.go.th/statistics/

RY. 1 Sedan (not more than 7 passengers) refers to a passenger car with seating capacity of no more than seven passengers[5] as shown in Figure 1.

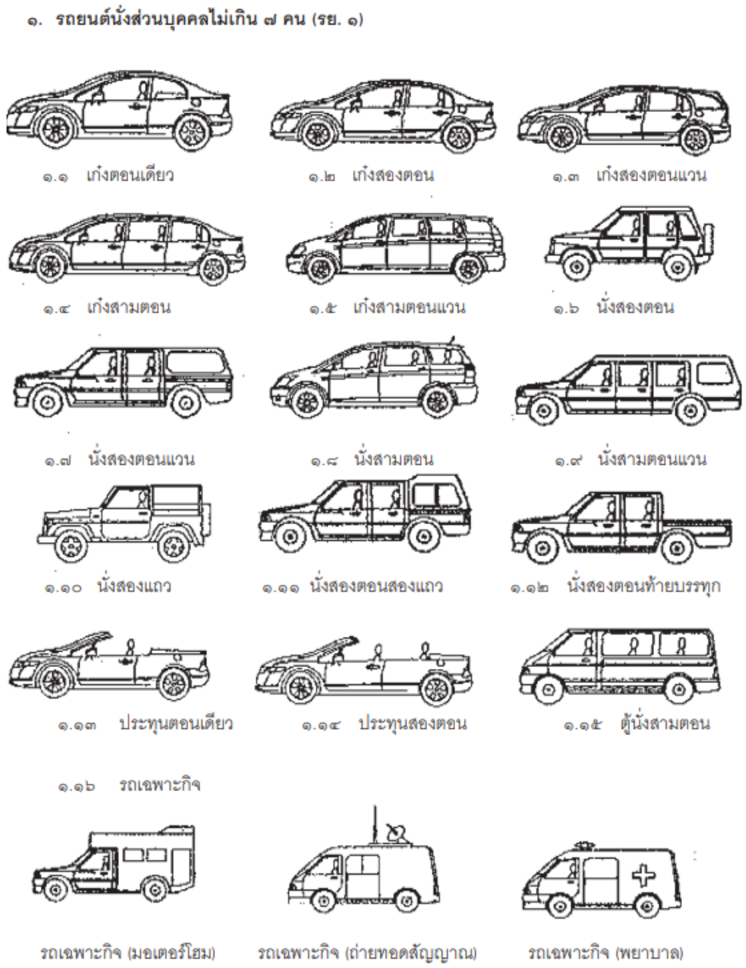

Figure 1 Sedan

RY. 2 Microbus & passenger van refers to a passenger car with seating capacity of more than seven passengers[5] as shown in Figure 2.

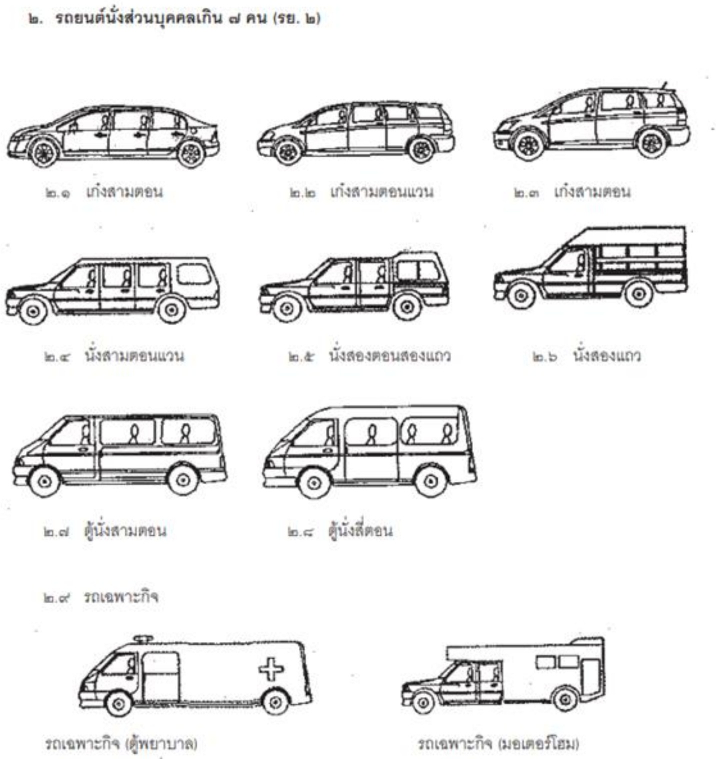

Figure 2 Microbus & passenger van

RY. 3 Van & pick-up refers to a carriage of goods[5] as shown in Figure 3.

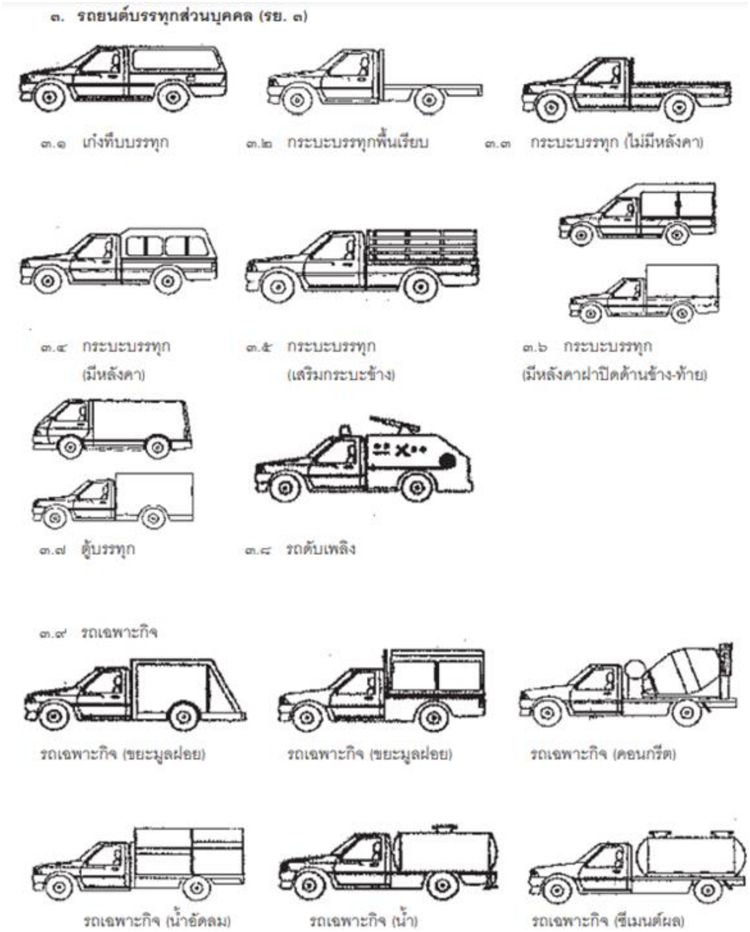

Figure 3 Van & pick up

RY. 5 Interprovincial taxi refers to a passenger car for hire with seating capacity of no more than seven passengers[5] as shown in Figure 4.

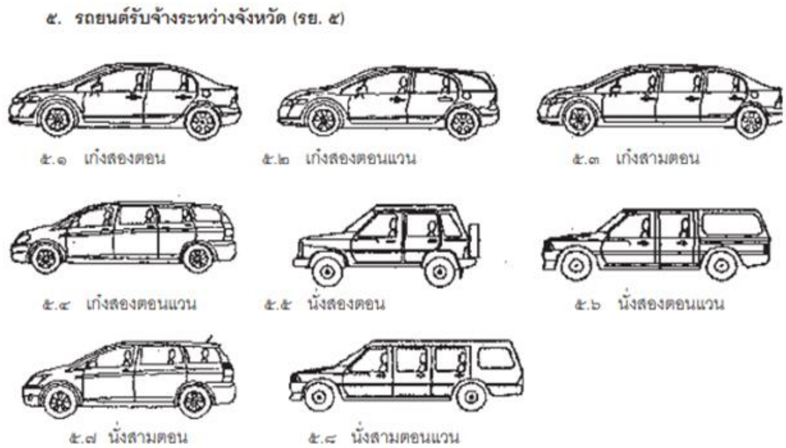

Figure 4 Interprovincial taxi

RY. 6 Urban taxi refers to a passenger car for hire with seating capacity of no more than seven passengers[5] as shown in Figure 5.

Figure 5 Urban taxi

RY. 9 Hotel taxi refers to a public passenger vehicle which is used to transport passengers between airports, ports, bus stations, train stations, or to transport passengers to hotels, residences, passenger offices, or business operators, and carries no more than seven passengers[5] as shown in Figure 6.

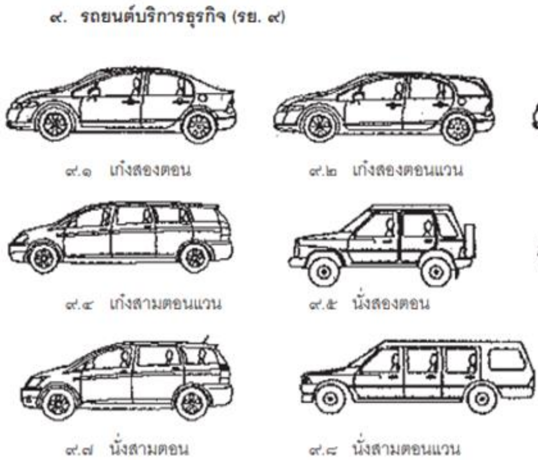

Figure 6 Hotel taxi

RY. 10 Tour taxi refers to a passenger car or a rental car with at least four doors which is a registered vehicle that tourism business operators use to transport passengers for tourism, with seating capacity of no more than seven passengers[5] as shown in Figure 7.

Figure 7 Tour taxi

RY. 11 Car for hire refers to a passenger car or a rental car that can seat only seven people and is a car provided for rent, not for hire to transport passengers or goods[5] as shown in Figure 8.

Figure 8 Car for hire

3.2.2 Zero Emission Vehicle (ZEV)

As per EU vehicle classification, vehicles are classified for regulatory purposes into the following main groups[6]:

Category M: vehicles carrying passengers;
Category N: vehicles carrying goods;
Category L: two- and three-wheel vehicles and quadricycles;
Category T: agricultural and forestry tractors and their trailers.

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[6] European Commission, Vehicle categories https://single-market-economy.ec.europa.eu/sectors/automotive-industry/vehicle-categories_en

Vehicles classified under Category M (passenger vehicles) and Category N (goods vehicles) are further divided into: light-duty vehicles (passenger cars and vans), or heavy-duty vehicles (trucks, buses, and coaches)[6]

Passenger cars and pick-up trucks covering eight categories under the Motor Vehicle Act B.E. 2522 correspond to several vehicle types under EU Regulation 2018/858 which classifies vehicle types into two main categories: Category M (vehicles designed for the carriage of passengers and their luggage) and Category N (vehicles designed for the carriage of goods).

Table 1 presents the alignment of Thai vehicle classifications with EU regulation vehicle categories. Motor Vehicle Act B.E. 2522 classifies vehicles based on their intended use, number of seats, and vehicle dimensions. Vehicle classification under EU Regulation 2018/858 is also based on intended use and number of seats, while it accounts for vehicle weight rather than vehicle dimensions.

Table 1 confirms the compliance of Thai vehicle categorization with EU Regulation 2018/858, with the exception of heavy quadricycles under RY. 1 which falls under Category L7e under EU Regulation 168/2013.

Table 1 Compliance of Thai vehicle standards with EU Regulation 2018/858[7]

<table>
<tr><th>Motor Vehicle Act B.E. 2522</th><th colspan="2">EU Regulation 2018/858</th></tr>
<tr><td>RY. 1, RY. 5, RY. 6, RY. 9, RY. 10, RY. 11</td><td>M1: Motor Vehicle with not more than eight seating positioning</td><td rowspan="3">Category M (the carriage of passengers and their luggage)</td></tr>
<tr><td>RY. 2</td><td>M2: Motor Vehicle with more than eight seating positions and having a maximum mass not exceeding 5 tonnes</td></tr>
<tr><td></td><td>M3: Motor Vehicle with more than eight seating positions and having a maximum mass exceeding 5 tonnes</td></tr>
<tr><td>RY. 3</td><td>N1: Motor Vehicle with a maximum mass not exceeding 3.5 tonnes</td><td rowspan="3">Category N (the carriage of goods)</td></tr>
<tr><td></td><td>N2: Motor Vehicle with a maximum mass exceeding 3.5 tonnes but not exceeding 12 tonnes</td></tr>
<tr><td></td><td>N3: Motor Vehicle with a maximum mass exceeding 12 tonnes</td></tr>
</table>

Note: RY. 1 also include L7e vehicles (heavy quadricycles) under EU Regulation 168/2013[8]

[7] European Union (2018), Regulation (EU) 2018/858 https://eur-lex.europa.eu/eli/reg/2018/858/oj/eng
[8] European Union (2013), Regulation (EU) 168/2013 https://eur-lex.europa.eu/eli/reg/2013/168/oj/eng

EU Taxonomy or the Commission Delegated Regulation (EU) 2021/2139[9] introduced technical screening criteria to determine the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate adaptation. ZEV proposed in KPI 2 of which the direct (tailpipe) CO_2 emissions are zero complies with technical screening criteria of **substantial contribution to climate change mitigation**, detailed as follows.

1. **Urban and suburban transport, road passenger transport**
    a. The activity provides urban or suburban passenger transport, and its direct (tailpipe) CO_2 emissions are zero.
2. **Transport by motorbikes, passenger cars and light commercial vehicles**
    a. For vehicles of category M1 and N1: Until 31 December 2025, specific emissions of CO_2, as defined in Article 3(1), point (h), of Regulation (EU) 2019/631, are lower than 50 gCO_2/km (low- and zero-emission light-duty vehicles). From 1 January 2026, specific emissions of CO_2, as defined in Article 3(1), point (h), of Regulation (EU) 2019/631, are zero.
    b. For vehicles of category L, the tailpipe CO_2 emissions equal to 0 gCO_{2e}/km calculated in accordance with the emission test laid down in Regulation (EU) 168/2013.

Compliance of KPI 2 against **ASEAN Taxonomy for Sustainable Finance**[10] was also confirmed. The document was developed as a designated guide for just energy transition towards sustainable finance and harmonizing classification of sustainable activities across ASEAN. ZEV proposed in KPI 2 of which the direct (tailpipe) CO_2 emissions are zero complies with technical screening criteria of **Tier 1 (Green)** as follows.

1. **Urban and suburban transport, road passenger transport**
    a. The activity provides urban or suburban passenger transport, and its direct (tailpipe) CO_2 emissions are zero.
2. **Transport by motorbikes, passenger cars and light commercial vehicles**
    a. For vehicles of category M1 and N1: Until 31 December 2025, direct emissions of CO_2 are < 50 gCO_{2e}/v-km. From 1 January 2026, direct emissions of CO_2 are 0 gCO_{2e}/v-km.
    b. For vehicles of category L, tailpipe CO_2 emissions are 0 gCO_{2e}/v-km.

Compliance of KPI 2 against **Thailand Taxonomy**[11] was also confirmed. The taxonomy aims to provide guidance, frameworks and standards for investors and stakeholders, attract international climate-oriented capital, enable and harmonize data disclosure, assess environmental risks and risk mitigation options, modulate state policy in the desired manner, and serve as a basis for data collection. ZEV proposed in KPI 2 of which the direct (tailpipe) CO_2 emissions are zero complies with criteria of **Green** category as follows.

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[9] European Union (2021), Regulation (EU) 2021/2139 https://eur-lex.europa.eu/eli/reg_del/2021/2139/oj/eng
[10] ASEAN Taxonomy Board (2024), ASEAN Taxonomy for Sustainable Finance https://asean.org/book/asean-taxonomy-for-sustainable-finance-version-3/
[11] Thailand Taxonomy Board (2023), Thailand Taxonomy Phase I https://www.bot.or.th/en/financial-innovation/sustainable-finance/green/Thailand-Taxonomy.html

1. **Other passenger land transport (which includes passenger cars)**
    a. Direct (tailpipe) CO_2 emissions of the vehicle are zero.
2. **Freight transport by road (which includes all freight transport operations by road)**
    a. Direct (tailpipe) CO2 emissions of vehicles are zero, and vehicles are not dedicated to fossil fuel transport.

3.3 Validity of the complied data set

3.3.1 Statistics for vehicle registrations and statistics for vehicle registrations

The annual registrations in KPI 2 correspond to the number of ZEV passenger cars and pick-up trucks that are newly registered in a specific year. There are two data sets on DLT website that may represent the annual registrations, namely the statistics for vehicle registrations and the statistics for vehicle registrations.

In the previous year's verification, the terms "**newly registered vehicles**" and "**first registered vehicles**" were adopted in accordance with the terminology on DLT website at that time. DLT has subsequently updated the terminology used on its website to "**statistics for vehicle registrations**" and "**statistics for new vehicle registrations**", respectively, in order to better align with the corresponding legal definitions. However, the underlying statistical methodology and the compiled data sets remain unchanged.

The definitions of **statistics for vehicle registrations** (previously newly registered vehicles) is shown as follows.

- New vehicles produced from domestic factories or vehicles imported from abroad for sale;
- New vehicles obtained from the Customs Department auction;
- New vehicles imported from overseas that are not for sale;
- Vehicles that have been registered under the Military Vehicle Act or vehicles that have been registered and have a symbol according to the regulations set by the Commissioner-General of the Police Department;
- Vehicles imported into the Kingdom as "used vehicles" that are not for sale;
- Vehicles made from old car parts;
- A vehicle assembled from some old car parts;
- Vehicles purchased from government auctions without registration or where the actual registration cannot be verified;
- Vehicles with chassis changes;
- The car that was previously reported not to be used forever;
- Vehicles previously registered under the Land Transport Act.

It should be noted that as the statistics for vehicle registrations include vehicles previously registered under the Land Transport Act B.E. 2522 that are transferred to the Motor Vehicle Act B.E. 2522. It also does not include a vehicle converted from a vehicle driven by internal combustion engine to a battery-powered vehicle, i.e., EV conversion. These vehicles will only need to report the change of fuel type (from gasoline or diesel to electricity) while it is not required to renew the registration as its category remains the same.

Statistics for new vehicle registrations (previously first registered vehicles) refer to newly registered vehicles, which have never been registered anywhere before, and are registered for the first time according to the Motor Vehicle Act or the Land Transport Act and have already paid taxes. This only includes the following cases:

1. New vehicles produced from domestic factories or vehicles imported from abroad for sale;
2. New vehicles obtained from auctions by the Customs Department that have never been registered anywhere before;
3. New vehicles imported from overseas that are not for sale.

Statistics for new vehicle registrations also do not include EV conversion. Additionally, the data set was not used for the preparation of the Sustainability-linked Financing Framework. Given that the total numbers of re-registered ZEVs and converted ZEVs are less than 0.1% of the total ZEV passenger cars and pick-up trucks and have negligible effects on the annual registrations of ZEV passenger cars and pick-up trucks, it is advisable to use the data set of statistics for vehicle registrations for the verification of KPI 2 with the attention on re-registered ZEVs and converted ZEVs.

3.3.2 Crosschecking with vendor reporting

Thailand Automotive Institute (TAI) publishes the sales of ZEVs based on a voluntary report by the vendors on its website. The annual sales of ZEV passenger cars and pick-up trucks compiled from vendors' voluntary report generally agrees with the data sets based on mandatory report on DLT website. The discrepancies were negligible, i.e., less than 0.1% of the total number. It is also worth noting that the updates of TAI website are slightly slower than DLT website as the reporting is not mandatory and not automatically done through a digitalized statistical system.

3.4 Quality of data collection and processing

Data quality assurance framework, as outlined in the **UN Toolkit for Quality Assessment of Administrative Data for Official Statistics**, covers data quality assurance of four key elements[12]:

1. **Statistical system and institutional environment:** This refers to the overall framework within which data is collected, processed, and disseminated, ensuring proper governance and institutional support for data management.
2. **Input/source data:** This concerns the original data collected, ensuring that it is accurate, reliable, and representative of the population or phenomenon being studied.
3. **Data processing:** This involves the methods and procedures used to clean, transform, and analyze the raw data, ensuring that any errors or inconsistencies are addressed, and that the data is appropriately prepared for analysis.

[12] UN Women and UNSD (2022), Toolkit for Quality Assessment of Administrative Data for Official Statistics https://data.unwomen.org/sites/default/files/documents/Publications/2023/ESA-admin-data-toolkit.pdf

4. **Statistical outputs:** This refers to the final data products or reports that are disseminated, ensuring they are relevant, accurate, and useful for the intended audience.

There are three dimensions to assess the quality of the four elements of the administrative data:

1. **Completeness**: This dimension measures the extent to which the data source includes all the necessary information to fully describe the subject matter as required by the users of the statistical product. The source data of the statistics for vehicle registrations, representing the annual registrations of ZEV passenger cars and pickup trucks, covers all relevant types of registrations in a year except for EV conversion. However, as mentioned above, the number of EV conversions is currently statistically insignificant.
2. **Uniqueness**: This dimension evaluates whether each data point can be traced back to an individual unit within the population, ensuring no duplication in the data. In this regard, the statistics for registrations of ZEV passenger cars and pickup trucks are automatically pulled from the mandatory registration at each DLT provincial office to the central system. The serial number which is unique to each vehicle is used to avoid double counting. Finally, the data is rechecked and verified by the responsible authority before being uploaded to the DLT website. Therefore, all data points are traceable.
3. **Validity**: This measures how well the data conforms to the expected format, type, and range, ensuring the data is consistent with predefined standards and expectations. The validity of the statistics for registrations of ZEV passenger cars and pickup trucks is ensured as the format and the type of data has always been consistent after the digitalization of the statistical system well before the collection of the baseline data set.

It can therefore be concluded that statistical system and institutional framework, input data, data processing, and statistical outputs of the statistics for registrations of ZEV passenger cars and pickup trucks compiled from DLT website generally comply with UN Toolkit for Quality Assessment of Administrative Data for Official Statistics.

3.5 Prospect of the trajectory of KPI 2 against SPT 2

3.5.1 Baseline and 2025 annual registrations of ZEV passenger cars and pick-up trucks

Error! Reference source not found. shows the recalculation of the annual registrations of ZEV passenger cars and pick-up trucks under the Motor Vehicle Act shown in the 2025 SLB Progress Report based on publicly available data sets on DLT website. The 2025 SLB Progress Report also compiled the annual registrations of all passenger cars and pick-up trucks and calculated the ZEV market share and achievement against SPT 2. The recalculated data matched perfectly with the information provided in the 2025 SLB Progress Report, showing the validity and traceability of the calculation. Any discrepancies between the annual registrations calculated from the DLT website and those compiled from the TAI website are negligible and can be explained by the time lag in reporting. While the annual registrations of ZEV passenger cars and pick-up trucks slightly decreased from 76,361 in 2023 (baseline year) to 70,582 in 2024, the registrations recovered significantly to 122,796 in 2025. It can also be observed from **Error! Reference source not found.** that the annual registrations of all passenger cars and pick-up trucks remain low in 2025 when compared to the number in 2019. The market share of ZEV passenger cars and pick-up trucks increased substantially from 10.87% in 2024 to 18.71% in 2025. Overall, The ZEV market share has shown a gradual upward trend since 2019, with particularly sharp increases observed during 2021-2023.

3.5.2 Baseline and 2025 annual registrations of ZEV and other electrified passenger cars and pick-up trucks

Table 3 shows the annual registrations of ZEV and other electrified passenger cars and pick-up trucks compiled from publicly available data sets on the DLT website. Similar to the trend observed for ZEV registrations, the number and market share of other electrified vehicles have gradually increased since 2019. The annual registrations of other electrified vehicles increased from 96,179 in 2023 (baseline year) to 155,177 in 2025, while their market share increased from 11.35% to 23.65% over the same period. In 2025, both the annual registrations and market share of other electrified vehicles were slightly larger than those of ZEVs. It can also be observed from Table 3 that the growth trends of ZEVs and other electrified vehicles generally moved in the same direction throughout the study period. The synchronization of the growth of ZEVs and other electrified vehicles may imply the complementary nature of the two vehicle types during the transition towards transport electrification, at least when the ICE vehicles still dominate the share of the annual registrations of passenger cars and pick-up trucks.

Table 2 Information for evaluation of annual registrations of ZEV passenger cars and pick-up trucks

Items	Unit	*2019	*2020	2021	2022	2023	2024	2025
Total passenger cars and pick-up trucks registered	Car	1,018,722	818,810	779,924	890,615	847,385	649,280	656,274
Number of registered ZEV passenger cars and pick-up trucks	Car	691	1,288	1,958	9,674	76,361	70,582	122,796
ZEV market share	%	0.07	0.16	0.25	1.09	9.01	10.87	18.71
Achievement against target	%	0.16	0.29	0.45	2.20	17.35	16.04	27.91

** The data for the years 2019 and 2020 are sourced from the Technical Review Report for 2024, as the current DLT website only provides annual data for the past 5 years (2021-2025)*

Table 3 Information based on statistics for annual registration of passenger cars and pick-up trucks

Items	Unit	*2019	*2020	2021	2022	2023	2024	2025
Total passenger cars and pick-up trucks registered	Car	1,018,722	818,810	779,924	890,615	847,385	649,280	656,274
Number of registered ZEV passenger cars and pick-up trucks	Car	691	1,288	1,958	9,674	76,361	70,582	122,796
Number of registered other electrified passenger cars and pick-up trucks	Car	26,447	29,465	41,399	74,899	96,179	136,018	155,177
Number of registered ICE passenger cars and pick-up trucks	Car	991,584	788,052	736,568	806,042	674,845	442,680	378,301
ZEV market share	%	0.07	0.16	0.25	1.09	9.01	10.87	18.71
Achievement against target	%	0.16	0.29	0.45	2.20	17.35	16.04	27.91
Other electrified vehicle market share	%	2.60	3.60	5.31	8.41	11.35	20.95	23.65

** The data for the years 2019 and 2020 are sourced from the Technical Review Report for 2024, as the current DLT website only provides annual data for the past 5 years (2021-2025)*

3.5.3 Monthly registrations of ZEV passenger cars and pick-up trucks

Monthly registrations of ZEV passenger cars and pick-up trucks were plotted to confirm the trend of customers' appetite for ZEVs. **Error! Reference source not found.** shows the monthly registrations of ZEV passenger cars and pick-up trucks in 2024 and 2025. The spikes observed in January 2024, January 2025, May 2025, and June 2025 are considered outliers due to nationwide motor events and the surge towards the end of the financial support under EV 3.0 and EV 3.5. The linear regression trendline of the remaining months shows a gradual increase in monthly registrations since 2024. This is consistent with the increasing market share of ZEV passenger cars and pick-up trucks.

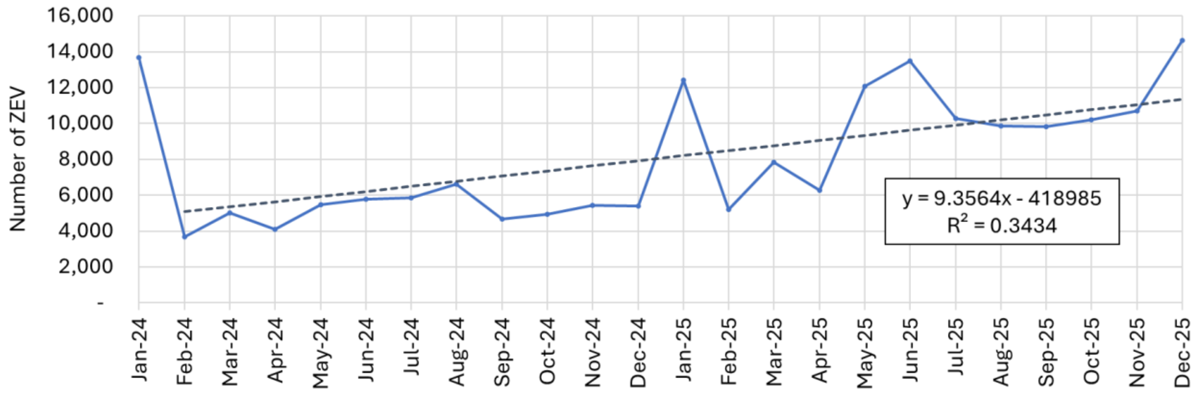

Figure 9 Monthly registrations of ZEV passenger cars and pick-up trucks

3.5.4 Trajectories of annual registrations of ZEV passenger cars and pick-up trucks

Figure 10 assumed that there are no policy alterations which makes the linear trend continue. The graph shows linear extrapolation based on monthly registrations during 2024-2025. Reduced financial incentives and increased local production requirements in EV 3.5 resulted in a slower growth rate of ZEV registrations in the beginning. However, registrations continued to increase towards the end due to the absence of a subsequent financial support. Linear extrapolation of the historical registration data indicates that the targets, including KPI-2, may not be met. Additional policy measures are therefore still needed to accelerate the growth rate and support the achievement of SPT 2.

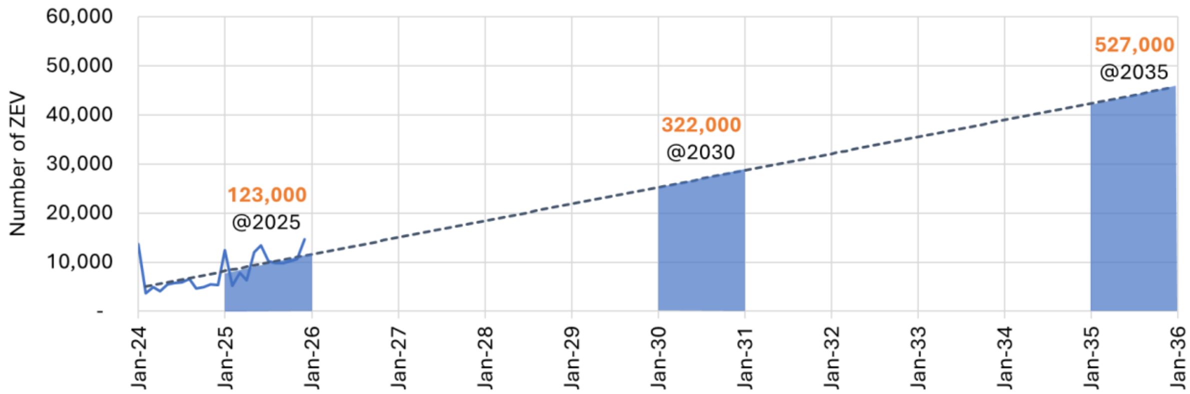

Figure 10 Business-as-usual scenario (linear extrapolation)

The 30@30 target scenario shown in Figure 11 is developed to illustrate the expected projection towards the attainment of KPI-2. Monthly registrations are projected using a constant growth rate assumption. A constant monthly growth rate of approximately 1.6 – 1.7%, which is not substantially different from the current growth rate, would allow annual ZEV registrations to reach the targets established under the EV 30@30 policy. However, future market conditions may change significantly due to factors such as lower or discontinued financial subsidies, lower annual vehicle registrations, increasing stocks of old vehicles, and consumer choices between ZEVs and other electrified technologies. These factors may affect the feasibility of achieving the projected targets. Figure 11 also compares the business-as-usual scenario with the 30@30 scenario and shows the gaps between the two trajectories. To bridge this gap, additional policy interventions are necessary to boost annual vehicle sales and accelerate the adoption of zero-emission vehicles in the market.

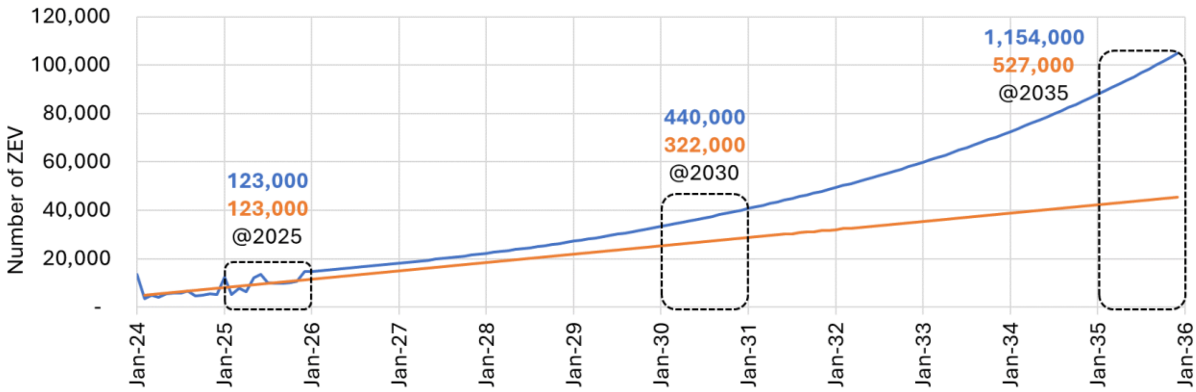

Figure 11 Comparison between business-as-usual scenario and 30@30 scenario

3.6 Implementation status of policy measures

Several key policy measures directly and indirectly contribute to increase in annual registrations of ZEV passenger cars and pick-up trucks. The following policy measures serve as key strategies to drive the adoption of ZEVs, and their implementation status were confirmed.

3.6.1 EV 3.0 and EV 3.5 incentive packages

EV 3.0 incentive package was issued to support the acceleration of ZEV production and utilization in Thailand. It provided subsidies for purchasing an EV and reduction of excise tax and import duties, and in turn requires local production from the manufacturers as detailed below.

1. **Subsidy for EV purchase**
    a. 70,000 THB subsidy for EV passenger cars priced not more than 2 million THB, with a capacity < 30 kWh battery
    b. 150,000 THB subsidy for EV passenger cars and pick-up trucks priced not more than 2 million THB, with a capacity > 30 kWh battery

2. **Reduction of excise tax and import duties**[13]
    a. Reduction of excise tax from 8 to 2% with additional reduction in import duties up to 40% for EV passenger cars priced not more than 2 million THB.
    b. Reduction of excise tax from 8 to 2% with additional reduction in import duties up to 20% for EV passenger cars priced over 2 million THB.
3. **Local production requirement**[14]
    a. A ratio of 1:1 local production to those imported in 2024 (extend the production period until January 2026)
    b. A ratio of 1:1.5 local production to those imported in 2025 (extend the production period until January 2026)

Although the incentive package expired in December 2023, the implementation has successfully led to an increase in the number of EVs and a significant growth in the domestic market.

EV 3.5[15] incentive package superseded EV 3.0 incentive package to continue subsidies for EV purchase at lower rates. It maintained the reduction of excise tax, but it did not cut import duties for high-price vehicles. It also increased the requirement for local production as detailed below.

1. **Subsidy for EV purchase**
    a. 25,000 to 50,000 THB for EV passenger cars and pick-up trucks priced under 2 million THB, with a capacity < 50kWh battery
    b. 50,000 to 100,000 THB for EV passenger cars and pick-up trucks priced under 2 million THB, with a capacity > 50kWh battery
2. **Reduction of excise tax and import duties**
    a. Reduction of excise tax from 8 to 2% with additional reduction in import duties up to 40% for EV passenger cars priced not more than 2 million THB.
    b. Reduction of excise tax from 8 to 2% for EV passenger cars priced over 2 million THB but not more than 7 million THB.
3. **Local production requirementError! Bookmark not defined.**
    a. A ratio of 1:1.5 local production or import by 2026 (extend the production period until January 2028)
    b. A ratio of 1:1.5 local production or import by 2027 (extend the production period until January 2028)

Following the implementation of EV 3.0 and EV 3.5 incentive packages, Thailand's EV Board introduced additional flexibility measures to moderate local production requirements and support continued EV market expansion. Manufacturers under the EV 3.0 scheme were allowed

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[13] Excise Department (2022), Criteria, procedures, and conditions for eligibility under the support measures for the use of electric vehicles, including cars and motorcycles https://webdev.excise.go.th/act2560/780-2022-03-21-09-51-58

[14] Thailand Board of Investment (2025), Thailand EV Board Adjusts EV3, EV3.5 Terms to Promote Exports as Investment in EV Supply Chain Tops 137 Billion Baht https://www.boi.go.th/index.php?page=press_releases_detail&topic_id=137207

[15] Thailand Board of Investment (2023), EV Board Gives the Green Light to EV 3.5 Package, Positioning Thailand as the Key Regional Hub for Electric Vehicle Manufacturing https://www.boi.go.th/index.php?page=press_releases_detail&topic_id=134676

to use additional factories to fulfill production commitments, while the period for imported battery cells to qualify towards local content requirements was extended to 30 June 2026. The deadline for exported EVs under EV 3.0 and EV 3.5 schemes was also extended to 30 June 2026, with exported vehicles allowed to be counted as 1.5 units toward production obligations. In addition, the EV Board introduced a 'Reverse Exit' option for imported EVs that no longer receive subsidies, allowing manufacturers to repay the excise tax difference and remove those vehicles from production commitments[16].

Although these flexibility measures may help facilitate compliance with local production requirements and support investment continuity, the transition from EV 3.0 to EV 3.5 with lower subsidy rates, followed by the end of EV 3.5 incentives, has reduced the growth rate of EV registrations and domestic market expansion. This indicates that financial incentives have played and will continue to play an important role in supporting EV adoption and increasing the number of EVs in Thailand.

3.6.2 Thailand's new excise tax structure

As shown in Figure 12, Thailand has implemented a new vehicle excise tax structure since 1 January 2026, incorporating local content conditions and requirements for advanced driver assistance systems (ADAS), while still maintaining its focus on carbon dioxide emission reduction. The revised structure results in higher tax rates for ICE vehicles with higher CO_2 emissions and supports the enforcement of local production requirements under EV 3.0 and EV 3.5 incentive packages. In parallel, Thailand's EV Board also fast-tracked the adoption of operational guidelines and review processes for manufacturers, particularly regarding CO_2 emissions, local parts requirements, and ADAS safety standards for electrified vehicles, including hybrid electric vehicles (HEVs), mild hybrid electric vehicles (MHEVs) and plug-in hybrid electric vehicles (PHEVs).

[16] Thailand Board of Investment (2025), EV Board Approves Policy Refresh to Strengthen Thailand's Electric Vehicle Ambitions
https://www.boi.go.th/index.php?page=press_releases_detail&topic_id=138252&_module=news&from_page=press_releases2

Previous Car Excise Tax Structure (as of 2022)

Focusing Point: Environment: CO_2 Emission

Vehicle Type	Current Excise Tax Rate	Tax Rate Conditions
Passenger Car: ICE	20% - 40%	Tax Rate depends on Engine Size, CO_2 Emission and Fuel Types
Passenger Car: HEV	4% - 40%	Tax Rate depends on Engine Size, CO_2 Emission and BOI incentive* *Remark:** ** Excise Tax (with BOI) = 4%-13%* ** Excise Tax (without BOI) = 8%-26%* *(Depend on CO2 emission)*
Passenger Car: PHEV	4% - 40%	
Passenger Car: BEV	0% - 8%	Tax Rate depends on BOI incentive* *Remark:** ** Excise Tax (with BOI): 0% (for 2020-2022) and 2% (for 2023-2025)* ** Excise Tax (without BOI): 8% (for 2020-2025)*
Passenger Car: FCEV	8%	-
Pickup	2% - 40%	Tax Rate depends on Engine Size, CO_2 Emission and Fuel Types
PPV	20% - 40%	Tax Rate depends on Engine Size, CO_2 Emission

New Excise Tax Structure (2026-2030)

Focusing Point: Environment: CO_2 Emission + Safety: ADAS

New Excise Tax Rate	Tax Rate Conditions
13% - 50% *(Step up every 2 years)*	• Tax Rate depends on Engine Size, CO_2 Emission + Install ADAS (2 from 6)
6% - 40% *(Step up every 2 years)*	• Tax Rate depends on Engine Size, CO_2 Emission + Install ADAS (2 from 6) + Use domestic battery or parts for assembly*
5% - 30%	• Tax Rate depends on Engine Size, E-Range and Fuel Tank Size. + Install ADAS (2 from 6) + Use domestic battery or parts for assembly*
2% - 10%	+ Install ADAS (3 from 6) + Use domestic battery or parts for assembly*
1% - 5%	
2% - 50%	• Tax Rate depends on Engine Size, CO_2 Emission and Fuel Types. + Install ADAS (1 from 6)
16% - 50%	

Figure 12 Thailand's new excise tax structure[17]

Appropriate differentiation of tax rates based on CO_2 emissions remains important to encourage the transition toward EVs and lower-emission vehicles while minimizing impacts on government excise tax revenue. In addition, incorporation of local content conditions and ADAS requirements will help support the transition of Thailand's automotive industry through the development of local manufacturing capacity, technology adaptation, and higher vehicle safety standards.

3.6.3 Carbon tax

The Parliament approved a carbon tax of 200 Thai Baht per ton-CO_2 equivalent for all fossil fuels in January 2025[18]. The current phase mainly focuses on raising public awareness of carbon tax without significantly affecting retail fuel prices. Thai Government plans to strengthen the role of carbon pricing through phased implementation and gradually increase the unit carbon tax. In the long run, carbon tax can serve as an additional mechanism to support greenhouse gas emission reduction in both energy and transportation sectors.

3.6.4 Soft loan for electrified vehicles

Some financial institutions in Thailand have started introducing soft loan programs to support low-carbon vehicle adoption[19]. The programs generally offer lower interest rates compared to normal market rates and cover all types of electrified vehicles. The loans are currently limited to new vehicle purchases. Applications are required to be made through participating financial institutions or non-bank providers, while conditions and service periods may vary depending on the policies of each institution.

[17] SAIC Motor-CP (MG) (2025), The New Excise Tax 2026 Readiness Automotive Tax Structure
[18] Excise Department (2025), Excise Department Notice on Criteria and Conditions for Carbon Pricing of Oil Commodities and Oil Products
https://lawelcs.excise.go.th/lawdetail?id=8985
[19] Government Savings Bank (2026), Soft Loan GSB https://www.gsb.or.th/news/gsbpr14-69/

Soft loans specifically for electrified vehicles can serve as an additional mechanism to support vehicle electrification by improving accessibility to vehicle financing, particularly following the gradual reduction of direct EV subsidies in recent years. However, they are currently available only through selected financial institutions and support all electrified vehicle technologies rather than exclusively promoting ZEVs, meaning that the measure may contribute to the expansion of both battery electric vehicles (BEVs) and hybrid vehicles.

3.6.5 Promotion of electric vehicle charging outlets

Thailand's EV Board set targets for EV DC charging outlets, aiming to reach 12,000 DC fast charging outlets by 2030[20]. According to the Electric Vehicle Association of Thailand (EVAT), there were already 8,595 DC charging outlets as of 31 January 2026[21], indicating substantial progress towards the national target. While expansion of EV DC fast charging infrastructure can indirectly improve public confidence in long-distance EV travel which is one of the key concerns among potential EV buyers, the concentration of charging outlets in city area[22] leads to the necessity of thorough planning and preparation for a long journey.

In parallel with public charging infrastructure expansion, home charging has become another important supporting factor for EV adoption in Thailand. Most major EV brands currently provide complimentary home chargers together with EV purchases, helping promote EV usage particularly for daily urban commuting. However, installation of EV charging systems in condominiums remains relatively more complicated, as it generally requires agreement from co-owners and compliance with electricity safety requirements and building conditions under the Building Control Act B.E. 2522[23]. Although the process can be complicated, installation of charging systems in condominiums is deemed feasible and is gradually increasing in urban areas.

3.6.6 Old car for new car scheme

Thailand is currently developing the old car for new car scheme for future submission to the Cabinet. The scheme aims to encourage owners of old vehicles to permanently retire eligible vehicles and replace them with newer low-emission vehicles through financial incentives or tax benefits. The proposed measure is expected to cover BEV, HEV, and PHEV technologies and may initially be implemented as a pilot covering approximately 10,000-20,000 vehicles. Eligible replacement vehicles are also expected to align with Thailand's CO2-based excise tax structure and domestic manufacturing requirements. Current policy discussions also emphasize that old vehicles entering the scheme must be permanently removed from the road in order to reduce

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[20] EPPO (2021), Direction for Electric Vehicle Promotion https://www.eppo.go.th/index.php/en/component/k2/item/17415-ev-charging-

[21] EVAT (2026), Number of Electric Vehicle Charging Stations in Thailand https://evat.or.th/wp-content/uploads/2026/04/EVAT01_Charging-Station-2026_Jan.pdf

[22] EVAT (2026), Thailand EVSE Map https://evsemap.evat.or.th/

[23] Chetthawit Musikasiri (2017), Legal Measures Related to the Operation of Charging Stations for Electric Vehicles https://ethesisarchive.library.tu.ac.th/thesis/2017/TU_2017_5701034810_8836_8409.pdf

pollution and support the transition toward advanced automotive technologies and EV manufacturing[24].

The scheme can also serve as an additional mechanism to support fleet modernization and reduce average CO_2 emissions from the transport sector by removing older and higher-emission vehicles from the fleet. This measure is particularly important as Thailand's total vehicle registrations have continued to decline in recent years. Although the scheme does not exclusively promote ZEVs, as HEV and PHEV vehicles are also included, it could still indirectly support the progression of KPI 2 by increasing the share of lower-emission vehicles entering the market. However, the policy remains under development and has not yet been officially approved or implemented.

3.6.7 70@30 policy framework and transformation of auto parts suppliers

As shown in Figure 13, Thailand aims to maintain its position as a major global automotive manufacturing hub under the 70@30 policy framework. Although the transition toward EVs still gradually continues, achieving this target requires strong collaboration among domestic manufacturers, sufficient market demand, and preparedness for competition in next-generation vehicle technologies. In line with current vehicle purchasing trends, the production targets under the framework have been revised by reducing the ICE vehicle production target from 1.75 million to 1.4 million units and the EV production target from 0.75 million to 0.6 million units.

At present, ICE vehicles continue to dominate the Thai automotive market, while HEV, MHEV, PHEV and BEV technologies are not yet directly competing due to rather limited market shares[5]. However, as the share of ICE vehicles gradually declines in the future, competition for market share among various electrified vehicles (xEVs) may intensify, potentially influencing future investment directions and technology choices within the automotive industry. This transition also affects the auto parts industry, as EVs contain fewer moving parts than ICE vehicles[25], leading to lower demand for conventional engine-related components. Thai auto parts manufacturers therefore need to adapt towards EV-related components and other advanced manufacturing industries. All in all, support for all electrified technologies during the transition period will help ensure a sustainable transformation of Thailand's automotive and auto parts industries.

[24] The Government Public Relations Department (2026), Old car for new car scheme https://radiothailand.prd.go.th/th/content/category/detail/id/57/iid/498091
[25] Thailand Automotive Institute (2020), Basic Knowledge of Electric Vehicles https://www.thaiauto.or.th/2012/th/services/ev/pdf/ev-Intro.pdf

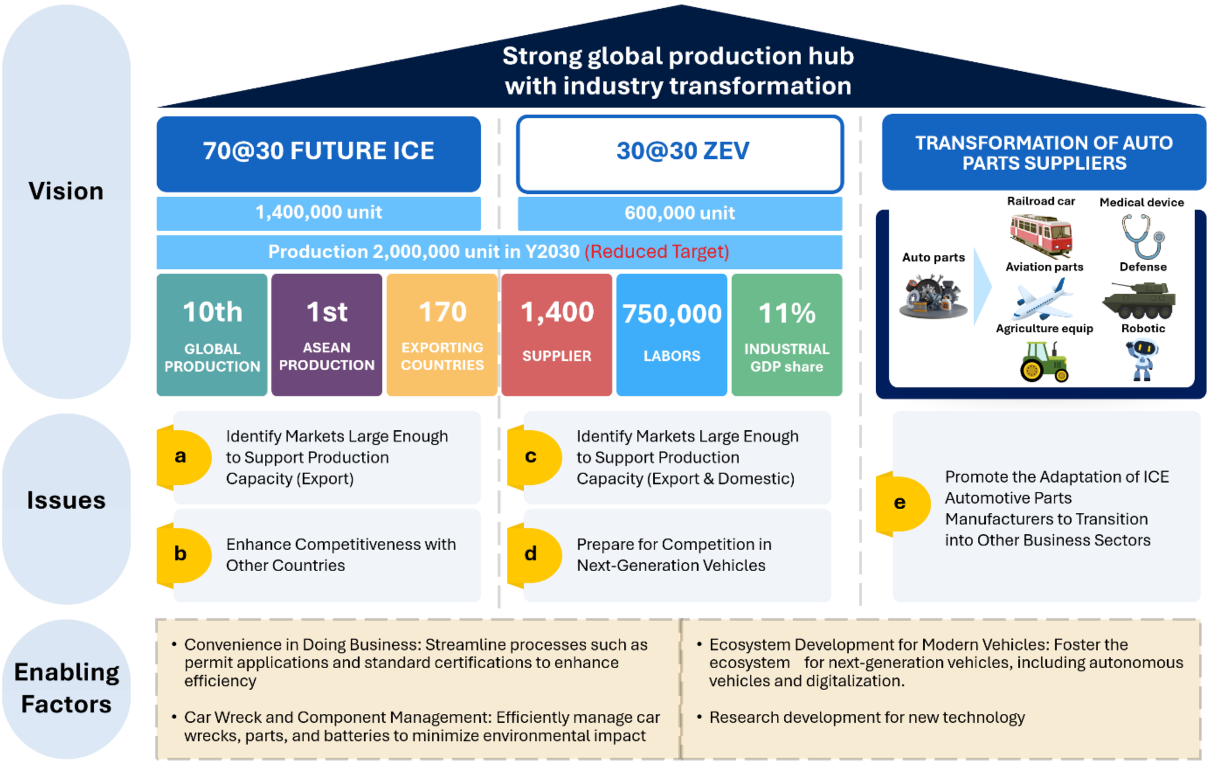

Figure 13 Thai Automotive Industry Vision 2030[26]

3.6.8 Improving ZEV supply chain

There are several other policy measures that support the ZEV supply chain. In February 2024, the EV Board also approved grants for EV battery cell manufacturers from the Competitiveness Enhancement Fund. The investors must be well-recognized battery manufacturers, have a clear production plan, and produce battery cells with high energy density and high life cycle which are suitable for EVs[27].

In June 2024, the Thailand Board of Investment approved a new investment promotion category covering service centers for repair, repack, and reuse of used EV batteries and storage systems[28]. Thailand is also promoting extended producer responsibility (EPR) policy, requiring producers' responsibility for environmental impacts of targeted products[29]. Vehicle manufacturers and importers are required to take proper responsibility for the end-of-life of their products.

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[26] Auto Parts Industry Club, The Federation of Thai Industries (2025)
[27] Thailand Board Investment (2024), Thailand EV Board Approves Extended Production Timeframe for BEV and Inclusion of Mild HEV in Hybrid Incentive Package to Support Industry's Electrification https://osos.boi.go.th/EN/news/2138/Thailand-EV-Board-Approves-Extended
[28] Thailand Board of Investment (2024), Thailand BOI Approves Investment Worth USD1.54 billion in Biochemicals, Data Centers, and Hospital; Sets New Promotion Category for the Repair of Used EV Batteries and ESS https://en.prnasia.com/releases/apac/thailand-boi-approves-investment-worth-usd1-54-billion-in-biochemicals-data-centers-and-hospital-sets-new-promotion-category-for-the-repair-of-used-ev-batteries-and-ess-450792.shtml
[29] Department of Industrial Works (2025), Analysis Report on Impact from the Act, Draft Industrial Waste Management Act https://www.diw.go.th/webdiw/wp-content/uploads/2025/08/a04082568-02.pdf

Building on these measures, Thailand emphasizes battery recycling and the development of long-life battery cells, encouraging manufacturers to recover materials from used batteries and investors to produce cells that sustain EV performance over time. These initiatives strengthen the EV battery ecosystem and support the sustainable growth of the ZEV market[30]. These efforts contribute to KPI 2, ensuring the availability of quality batteries, recycling infrastructure, and services across the EV lifecycle.

3.7 Possible policy measures to accelerate growth in annual registrations of ZEV passenger cars and pickup trucks

The annual registrations of ZEV passenger cars and pickup trucks saw a significant increase from 2024 to 2025, showing the promising future for the attainment of KPI-2. The share of ZEV in Thailand has surpassed the tipping point[31] which is the point where a new technology becomes a common option in the market. The next step is to prepare the ZEV ecosystem that facilitates the usage of ZEV to maintain the competitiveness of the technology in the market. In addition, the decreasing total annual registration of passenger cars and pickup trucks indicates the necessity of additional policy measures to further accelerate the growth of annual registrations of ZEV passenger cars and pickup trucks.

Figure 14 shows the landscape of policy measures that may affect the annual registrations of ZEV passenger cars and pickup trucks. The information on these policy measures was gathered from current policy documents, policy announcements, news, and best practices from countries that successfully increased the penetration rate of ZEV or are gradually increasing the share of ZEV among passenger cars and trucks. Policy measures that are proved to support ZEV growth are indicated in green, those somehow supporting the growth in yellow, and those that may either increase or decrease the number of ZEV in pink. Solid line indicates policy measures being implemented in Thailand, dashed line for those in the preparation phase or the ending phase, no line for those yet to be done. Based on the analysis and the inputs from key stakeholders, there are three groups of policy measures that can contribute to the preparation of ZEV ecosystem that can sustain the growth of new ZEV registration.

1) Policy measures that facilitate the purchase of a new ZEV, including the publication of life-long total cost of ZEV against other options, cost reduction and coverage extension of ZEV insurance, soft loan with low interest rate, and removal of old cars from the ecosystem.
2) Policy measures that address the concerns of potential ZEV buyers, including promotion of charging infrastructure, and assurance of battery safety.
3) Policy measures that strengthen the wider ecosystem to maintain the competitiveness of Thai automotive industry, including investment in R&D and development of technical capability, and adoption of holistic approach for transition towards low-carbon transport.

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[30] The Nation (2026), A look at global battery laws: controlling impacts from production to toxic waste https://www.nationthailand.com/business/automobile/40066552

[31] BOI (2026), Thailand's supercharged EV sales poised for a new surge: Automakers lured by government policies tilt the global balance towards electric vehicles https://www.boi.go.th/en/advertorial16

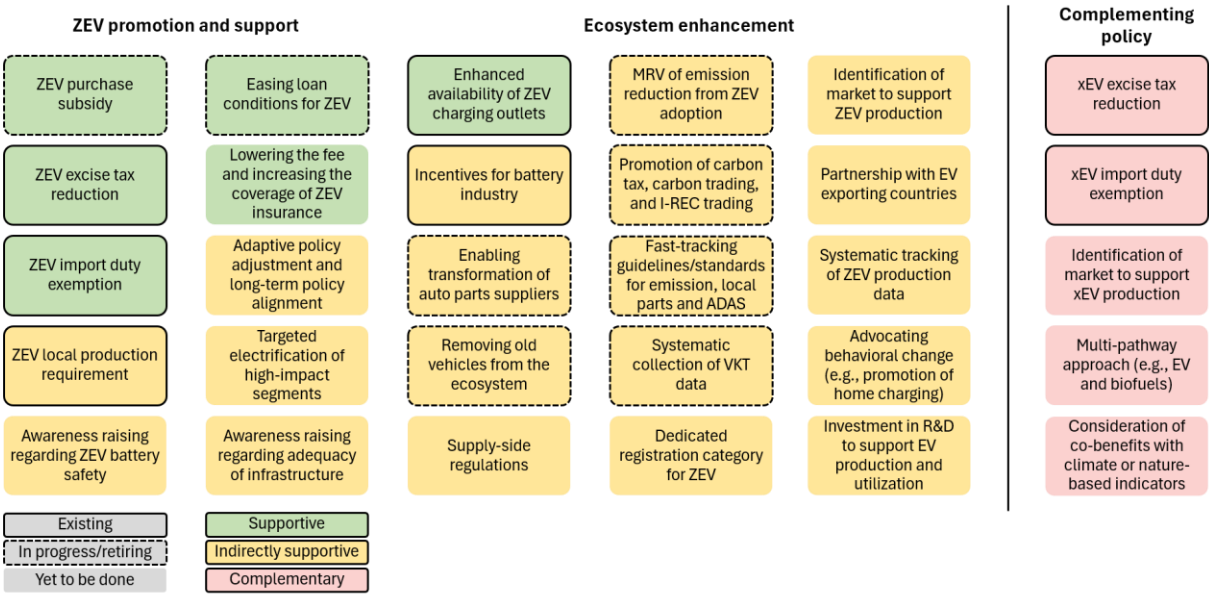

Figure 14 Landscape of policy measures with potential to support ZEV growth

3.7.1 Publication of comparative total cost of ownership of ZEV and other vehicle types

Statistics show that the growth in HEV and PHEV is more significant than that of ZEV in the US despite the 2026 global oil crisis[32]. This tendency can be found in many countries and is also expected in Thailand soon as the direct subsidy programs have all come to an end. The main factors causing hesitation to switch from ICE vehicles to ZEV are the higher retail price and the limitation in models of ZEV. While the retail price of ZEV can be much higher than that of HEV, PHEV, or ICE vehicles, the operating cost, including electricity cost and maintenance, is typically much lower. The total cost of ownership (TCO) that include the total cost of the entire lifetime of the vehicles[33] should be officially published so that the users are aware of the actual expenses of ZEV and other vehicle types and are able to take them into account during the decision making of the new car purchase.

3.7.2 Subsidy or discount for ZEV insurance cost and increase in insurance coverage

Another important issue impeding ZEV purchase is insurance. This includes the issue of insurance cost which is significantly higher than equivalent ICE or hybrid vehicles and the issue of insurance coverage which may not cover all conditions of battery replacement or repair. To maintain the advantage of ZEV, which is the low operation and maintenance cost, policy measures to partially subsidize or discount ZEV insurance cost and set standard insurance coverage for ZEV might be needed. This will further expedite the decision in new ZEV purchase.

[32] U.S. Energy Information Administration (2026), Electric vehicle sales fell as hybrid vehicle sales continued to rise in 2025 https://www.eia.gov/todayinenergy/detail.php?id=67144
[33] T. Champeecharoensuk (2025), Total cost of ownership (TCO) analysis of electric vehicle in ASEAN, Energy for Sustainable Development, 85, 101650

3.7.3 Encouragement of soft loans for ZEVs

The stagnating economy is one of the main reasons for the decrease in total annual registration of passenger cars and pickup trucks. The household debt level and the share of non-performing loans (NPLs) remain high in 2025. Even though the share of ZEV annual registration continues to increase, the limited total annual registration will eventually slow down the growth of the absolute number of ZEV annual registration. While one may be willing to replace an existing ICE vehicle with a new ZEV, high interest or strict conditions of the loan may postpone the decision. Several commercial banks started soft loans with lower interest rates for low-emission vehicles which typically include all types of electrified vehicles. The government may encourage all financial institutions to consider dedicated soft loans for ZEVs to accelerate the transition.

3.7.4 Removal of old vehicles from the ecosystem

Another indirect way to increase the annual registration of ZEV passenger cars and pickup trucks is to accelerate the removal of old vehicles from the ecosystem. As the conditions are better for ZEV purchases when compared to ICE vehicles, it is likely that ZEVs will be considered for the replacement of old cars. The old car for new car scheme which is being considered by the Thai Government will accelerate the retirement of the old cars. This scheme is being implemented in China as part of the promotion of new energy vehicles (NEVs)[34]. Another policy measure to be considered is to increase the annual vehicle tax for old cars and high-emission cars. Japan increases the annual road tax when a car has been used for more than 13 years by approximately 20%[35], and Germany increases its annual car tax according to the CO_2 emission per kilometer[36]. These policy measures would provide incentives for owners to abandon the old car and buy a new one.

3.7.5 Promotion of ZEV urban use and facilitation of charging infrastructure installation in residence and multi-unit properties

As mentioned in 3.6.5, Thailand has successfully met the target number of fast charging outlets during 2025. On the other hand, the charging stations are not evenly distributed across the country, and the increase in the number of ZEVs outpaced the increase of charging stations, bringing about concerns on adequacy of charging outlets. Meanwhile, for urban use with few tens of kilometers journeys, there is no issue with charging outlets if wall chargers are installed in houses, apartments, or condominiums. Recent sales of ZEVs also often include wall chargers in the package. If ZEV urban users can install wall chargers at their residence, the limited number of charging stations will no longer be a critical issue. However, as noted in 3.6.5, the installation of charging facilities in multi-unit properties requires agreement by co-owners and approvals under the Building Control Act B.E. 2522[23], which makes the procedure troublesome. Facilitation or exemption of these approvals will contribute to the promotion of ZEV urban use. In the longer

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[34] IEA (2026), Large-Scale Equipment Renewal and Consumer Goods Replacement Policy https://www.iea.org/policies/26486-large-scale-equipment-renewal-and-consumer-goods-replacement-policy
[35] OIST (2026), Annual Road Tax https://www.oist.jp/resource-center/annual-road-tax
[36] eCarsTrade (2026), Guide for Traders: Car Taxes in Germany https://ecarstrade.com/blog/car-taxes-in-germany

term, incentives to induce installation of charging stations in sparsely populated areas will also be needed to balance out the distribution of ZEV charging infrastructure, especially in stopover towns between large cities.

3.7.6 Prioritization of assurance and awareness raising for battery safety

While Thai Industrial Standards Institutes have issued several standards for battery safety in accordance with international standards, e.g., UN R100, UN R136, recent fire events due to malfunction of ZEV battery have raised concerns among ZEV users and potential users. UN R100 has just been updated with the change of concept from passive safety to active safety and the mandate of alarm and prevention of thermal propagation, and the Chinese latest standard has zero tolerance to fire and explosion[37]. Thailand will also need to gradually update its ZEV battery standards to enhance battery safety and prepare the industry to be able to comply to those standards. It is also necessary to start an awareness raising campaign to ensure public trust on the safe use of EV batteries and to advise actions to be taken during fire or explosive events.

3.7.7 Investment in R&D and technical cooperation with exporting countries to develop technical capability of the industry

Inclusion of requirements for advanced driver assistance systems (ADAS) in the conditions for excise tax reduction is a crucial step towards the retention of technical capacity which has been the strength of Thai automotive industry. Investment in research and development along with continuous development of human capital has proved to be efficient in building the foundation to support the sustained growth of the industry. Thailand can maximize the benefits from the establishment of the world's fourth China Automotive Technology and Research Center (CATARC) in Thailand[38] to develop ZEV technical capability and even aim to be the EV hub of Southeast Asia.

3.7.8 Holistic approach for transition towards low-carbon transport

While acceleration of the growth in annual registrations of ZEV passenger cars and pickup trucks is the core of the discussion, ZEV promotion is only a single dimension of the transition towards low-carbon transport, and the policy measures must be designed with the considerations of all key aspects. Thai automotive industry has been developed around ICE vehicles, and the auto parts industry has heavily relied on the success of ICE vehicle development. Therefore, the transition will need to include HEV, PHEV, or even low-carbon ICE in the equation. In addition, as a self-sufficient biofuel country, increasing the blending ratio of biofuel should be considered as an option. Since the ultimate goal is to decarbonize the transport sector, all policy measures should lead to greenhouse gas emission reduction, and the effectiveness of the policy measures should be measured by emission reduction. For example, even though wheel-to-tank emission of ZEV is zero, it might not be the best option if the well-to-wheel emission is extremely high, e.g., electricity is generated by a coal-fired power plant. Therefore, a holistic approach needs to be taken to judge the best combination of policy measures.

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[37] TDRI (2026) https://tdri.or.th/2026/06/ev-battery-standards-gap-article/
[38] Ministry of Industry (2023) https://www.industry.go.th/th/industrial-economy/12788