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# PUBLIC SUPPORT FOR ELECTROMOBILITY: THE EUROPEAN UNION IN A GLOBAL COMPARISON

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**Abstract**

This article compares selected schemes supporting electromobility in four European Union Member States and seven non-EU countries. The aim is to determine how the schemes differ in terms of accessibility for beneficiaries, the powertrains they support, and conditions relevant to the automotive industry. The structured comparative analysis draws on official programme documentation available as of 16 September 2026 and market data for 2025. It distinguishes between purchase grants, tax relief and loan guarantees; historical changes are contextualised within the period 2023–2026. The comparison shows that geographical breakdown alone does not capture the differences between the schemes. Applicant and vehicle eligibility, the timing of benefit receipt, and the duration of support are also decisive factors. Furthermore, the French and Canadian cases demonstrate a link between purchase incentives and the place of manufacture. A key benefit is the standardised organisation of these conditions to assess the availability of support and to plan vehicle supply. The study does not evaluate the causal effects of the incentives or their cost-effectiveness

**Keywords:** electromobility; public support; European Union; automotive industry; international comparison

## 1. Introduction

The transition to electric vehicles is not merely a matter of environmental protection. It also concerns car prices, the availability of charging facilities, and the future production of vehicles and their components. The wider industrial context is also relevant, as Vranakova and Gyurak Babelova [23] examine the implementation of new technologies in industrial enterprises, including the automotive sector. Governments therefore employ various forms of support: purchase subsidies, lower taxes, preferential treatment for company cars, or support for charging stations. An overview by the European Automobile Manufacturers' Association (ACEA) shows that these measures vary significantly across EU member states [1].

However, simply comparing the highest possible subsidy can be misleading. A subsidy available to households is not the same as a benefit intended solely for businesses. Similarly, a tax relief on vehicle running costs has a different effect

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than money provided at the time of purchase. It is therefore necessary to consider not only the amount, but also the conditions under which it can be utilised.

This article aims to compare selected instruments supporting electromobility within and outside the EU and to identify which conditions are significant for customers and manufacturers. The research question is: How do the selected programmes differ in terms of the recipient, the type of powertrain supported, the form and duration of the support, and what consequences do these differences have for the availability of incentives and the planning of vehicle supply? The market context is provided by data from the IEA [2]. In their review study, Hardman et al. [3] emphasise the importance of the timing of purchase incentives and the risks associated with their premature termination. Sheldon [17] draws attention to the need to distinguish between sales support and cost-effectiveness, and to the uneven distribution of benefits across income groups. This article builds on these perspectives with a structured overview of the current conditions of selected schemes. It does not undertake any new measurements of their effectiveness.

## 2. Comparison methodology and key concepts

The study employs a qualitative comparative analysis of public documentation. It covers the Czech Republic, Germany, France and the Netherlands, as well as China, the USA, Canada, Japan, India, the United Kingdom and Norway. This is a deliberate selection of different institutional arrangements and instruments: business financing, income-targeted subsidies, tax relief and changes to the availability of support. Both large automotive markets and cases that broaden the comparison to include high market penetration of electric vehicles and other modes of road transport are represented. The selection is not a representative sample of countries and does not allow individual programmes to be generalised to the national policy as a whole.

The unit of comparison is a selected national or federal programme, not the total volume of support in a given country. For each case, the following details are recorded from official sources: the beneficiary, the supported propulsion type or vehicle category, the support instrument and conditions for claiming it, and the current status. Table 2 consolidates these data into a single matrix. Instruments that influence the purchase or use of vehicles are included; direct investment support for manufacturers is not the subject of this analysis. Support for recharging is listed only as a related component of the programmes. A direct grant reduces the purchase cost, a tax relief reduces the tax liability, and a loan guarantee facilitates financing without replacing principal repayments. The nominal amounts of these instruments cannot, therefore, be directly added together or ranked in terms of cost-effectiveness. Zhao et al. [24] demonstrate the relevance of multi-criteria evaluation in the energy sector, where technical and decision-related factors must be considered jointly. Although their study focuses on smart grids rather than electromobility incentives, it provides a useful methodological perspective for future assessments extending beyond nominal subsidy amounts.

**A battery electric vehicle** (BEV) is powered solely by electricity stored in a battery. **A plug-in hybrid** (PHEV) combines an internal combustion engine with an electric motor, and its battery can be recharged from a mains socket or a charging station. A conventional hybrid is not recharged from the external electricity grid. In a hydrogen fuel cell vehicle, the electricity for propulsion is generated from hydrogen directly within the vehicle. It is important to distinguish between these: a scheme that supports electric vehicles does not necessarily support all hybrids. The term ‘zero-emission’ here refers to zero carbon dioxide ($CO_2$) emissions from the exhaust, not zero environmental impact from the production of the car, the battery and the energy used.

Technical papers from the DAAAM proceedings supplement the economic framework by highlighting differences between vehicles and their operation. Masic et al. [19] measure the dynamics, energy consumption and energy recovery of a specific electric commercial vehicle; their results emphasise the need to assess operating conditions. Georgieva et al. [20] present a tool for modelling a hybrid system comprising a fuel cell and a battery. For this comparison, the common designation of ‘zero-emission vehicle’ does not imply identical technical requirements or operating costs. These papers do not assess the effectiveness of public incentives.

Programme documentation was assessed as of 16 September 2026. The overview reflects the situation as of that date and selected changes during the period 2023–2026. This is not a continuous time series covering all incentives. Priority is given to the websites of programme administrators and government institutions, supplemented by overviews from ACEA, the IEA and the European Commission. A distinction is made between current rules, discontinued programmes and announced future changes. Market data for the whole of 2025 includes BEVs and PHEVs, but not conventional hybrids [2]. The EU refers to the 27 Member States. Norway and the United Kingdom are assessed separately. Market shares are provided for context only. The study does not estimate the causal effects of support, financial returns or the cost per unit of emissions reduced.

## 3. The European Union: common rules, differing support

### *3.1. What the EU sets out and what individual states set*

Within the EU, it is necessary to distinguish between two things. The EU sets common requirements for emissions from new cars, whilst specific subsidies and tax incentives vary between Member States [1, 4]. There is therefore no

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single, uniform 'European car subsidy'. Emissions regulations influence manufacturers' product ranges. Financial incentives are designed to facilitate the purchase or use of a vehicle.

The current framework sets a target of a 100 per cent reduction in the average $CO_2$ emissions from new passenger cars and vans from 2035. This does not constitute a ban on the use of all existing internal combustion engine vehicles. For the years 2025–2027, it has been permitted to assess compliance with emissions targets on a three-year average basis. The Commission's proposal from December 2025 to amend the target to 90 per cent and to offset the remaining emissions must be distinguished from the current rules [4]. Manufacturers mustn't confuse the proposed change with an already approved requirement when planning.

*3.2. Examples of national support*

**The Czech Republic** provides targeted support for businesses. The 'Electromobility Guarantee' programme, launched in March 2024, combined a guarantee from the National Development Bank for part of a business loan with a subsidy for the vehicle and charging. It was not possible to obtain the subsidy on its own; it required a loan. The application period has now closed [5]. This scheme is therefore not a blanket subsidy for households, but rather assistance for businesses in financing the purchase.

In 2026, **Germany** introduced means-tested support for households. The basic grant amounts to €3,000 for a battery electric vehicle and €1,500 for an eligible plug-in hybrid. Depending on income and the number of children, the grant for a battery electric vehicle can reach up to €6,000 [6]. It is therefore not only the type of car that is decisive, but also the applicant's circumstances.

Since July 2025, **France** has been offering a subsidy for selected all-electric passenger cars under the Energy Saving Certificates (CEE) scheme, which energy companies fund. The amount depends on the provider's offer and the subsidy's conditions, including household income and the place of manufacture of the vehicle and battery. Eligibility is restricted, amongst other things, by a purchase price of up to €47,000, a weight of less than 2,400 kg and a minimum environmental score. The purchase incentive thus also includes conditions that are significant for manufacturers [7].

**The Netherlands,** by contrast, is gradually phasing out the tax benefit. For zero-emission passenger cars, the motor vehicle tax discount will be 30 per cent in 2026–2028; it is set to fall to 25 per cent in 2029 and end from 2030 onwards. Plug-in hybrids no longer benefit from this discount [8]. This case illustrates that the end of a particular incentive can be a pre-planned, gradual process rather than a sudden cessation of all support.

These examples do not indicate a uniform European shift away from support. Rather, they show a change in its focus. In some places, it helps businesses with financing; in others, it assists lower-income households or favours a particular type of powertrain. Consequently, different conditions may apply to the same vehicle in different EU countries. The end of the purchase bonus does not necessarily mean the end of tax incentives or charging support [1].

## 4. The European Union compared with the rest of the world

*4.1. What proportion of the market do electric vehicles account for?*

In the EU in 2025, battery electric vehicles accounted for 17.4 per cent and plug-in hybrids for 9.4 per cent of new passenger car registrations [9]. Together, they account for approximately 26.8 per cent. According to the IEA, the combined share of both powertrain types in China reached almost 55 per cent, whilst in the US it remained below 10 per cent and globally stood at 25 per cent [2]. Table 1 below presents these shares in a standardised format. This is an indicative comparison of registrations and sales.

| Market | Share of BEVs + PHEVs in 2025 | Basis and data source |
|---|---|---|
| European Union (EU-27) | approximately 26.8 per cent | New passenger car registrations; ACEA [9]. |
| China | almost 55% | Sales of new passenger cars; IEA [2]. |
| United States | less than 10 per cent | Sales of new passenger cars; IEA [2]. |
| World total | 25 per cent | Sales of new passenger cars; IEA [2]. |

Table 1. Battery electric vehicles and plug-in hybrids in the new passenger car market in 2025 [2, 9]

The EU, therefore, lies between China and the US. However, this result alone does not prove where subsidies work best. Vehicle prices also influence sales, the range of models on offer and the availability of charging facilities. Furthermore, the share of new sales does not equal the share of all cars on the road: the replacement of older vehicles takes longer. A scheme introduced as late as 2026 cannot, therefore, be used to explain the results for 2025. The 2025 market shares reflect vehicle purchasing decisions under the policy frameworks and market conditions in place up to and during 2025, rather than the effects of incentives newly introduced in 2026. In particular, the German household purchase

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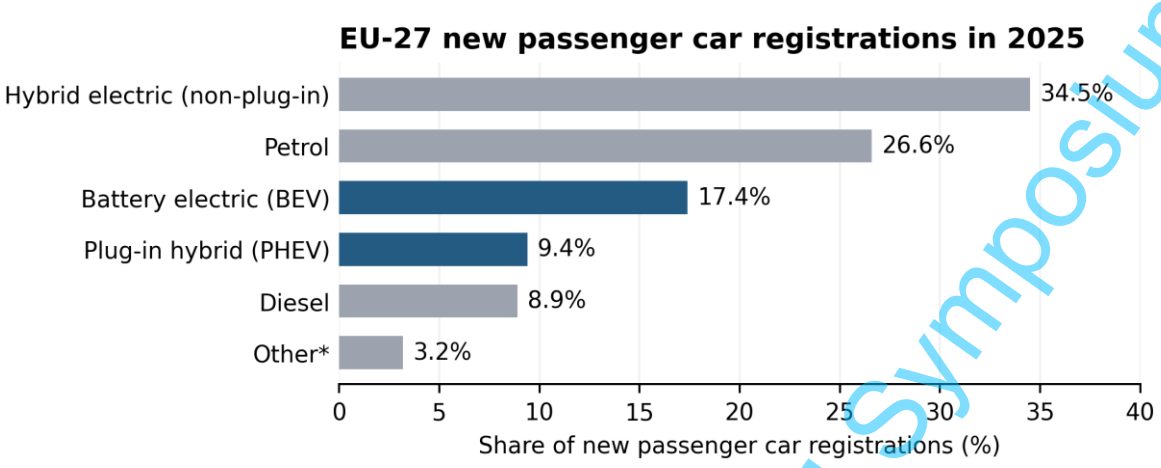
subsidy and the Canadian EVAP programme introduced in 2026 cannot explain the 2025 registration and sales figures. Their potential effects require subsequent market data and a separate evaluation.




Source: ACEA [9]. *Other = residual to 100%. BEV + PHEV = 26.8%.

Fig. 1. Composition of EU-27 new passenger car registrations in 2025. Source: ACEA [9]; own visualisation.

Figure 1 distinguishes plug-in vehicles from conventional hybrids. The combined share of BEVs and PHEVs is 26.8 per cent, whilst non-externally chargeable hybrids account for 34.5 per cent on their own. This distinction prevents overestimating the share of vehicles targeted by the instruments examined here [9].

*4.2. China, the USA and Canada: different approaches to support*

**China** applies a pre-determined, tiered tax relief scheme. In 2024–2025, eligible vehicles were exempt from purchase tax, with a maximum relief of 30,000 yuan per passenger car. In 2026–2027, the tax relief is halved, with the maximum relief set at 15,000 yuan. The scheme also covers plug-in hybrids and hydrogen fuel cell vehicles [10]. Compared with the French scheme, it is therefore open to a wider range of propulsion types.

**The United States** has discontinued selected federal purchase incentives. Tax credits for new, used and selected commercial zero-emission vehicles are not available for vehicles purchased after 30 September 2025 [11]. This deadline relates to the acquisition under IRS rules, not automatically to the vehicle's delivery date. The termination of these credits should not be equated with the discontinuation of all individual US state programmes.

From 16 February 2026, **Canada** will provide a grant through the Electric Vehicle Affordability Programme (EVAP). In 2026, this will amount to a maximum of 5,000 CAD for battery and hydrogen vehicles and 2,500 CAD for plug-in hybrids, and is set to decrease in subsequent years. The grant is deducted at the time of sale or eligible leasing. The vehicle must be manufactured in Canada or in a country with a free trade agreement with Canada. The transaction value must not exceed CAD 50,000, except for vehicles manufactured in Canada. The scheme is scheduled to run until 31 March 2031, or until funds are exhausted [12]. In addition to the subsidy amount, the vehicle's country of origin also affects eligibility

*4.3. Japan, India and non-EU European countries*

**Japan** supports multiple types of propulsion. The CEV programme covers battery-electric vehicles, plug-in hybrids, and hydrogen vehicles, with subsidies available for specific models [13]. This does not imply equal support for all technologies, nor does it mean that every standard hybrid is automatically eligible. Compared with schemes aimed solely at battery-electric vehicles, this is a broader but still conditional offer [1].

**India** extends the comparison to include other vehicle categories. The PM E-DRIVE programme covers electric two-wheelers and three-wheelers, buses, lorries and ambulances, as well as charging infrastructure. The conditions vary by category [14]. This is not equivalent to blanket support for private passenger cars. This case is therefore used to define the scope of the policy, rather than to make a direct comparison of passenger car subsidy levels.

Support for buses has a technical dimension in addition to the purchase price. Spirk and Kepka [21] analyse the dynamic loads and the battery system's mounting in the event of a collision involving an electric bus. In the context of this study, their work demonstrates why it is appropriate to separate a vehicle's financial eligibility from the requirements for a safe technical solution; however, it does not assess the Indian scheme.

**The United Kingdom** provides a subsidy for selected new zero-emission passenger cars, which is deducted from the price by the dealer. Depending on the vehicle category, this amounts to a maximum of GBP 3,750 or GBP 1,500.

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Eligibility also depends on range, warranty and sustainability criteria [15]. In Norway, from 2026, the VAT exemption for electric vehicles applies to the first NOK 300,000 of the purchase price. The portion above this limit is subject to the standard rate of 25 per cent [18]. **Norway** thus offers a tax incentive with a price threshold in a mature market: in 2025, BEVs and PHEVs accounted for approximately 97 per cent of new car sales [2]. This share does not represent an estimate of the effect of the tax relief alone.

## 5. Key findings and practical implications

Table 2 compares selected schemes according to uniform criteria. The EU level does not constitute a separate subsidy scheme. The common regulatory framework is described in Chapter 3.1. Member States are therefore listed individually in the matrix. For the USA and the Czech Republic, the termination of the relevant scheme or the closure of applications is also noted to avoid confusion between historical support and the current offering.

| Country and programme | Recipient and powertrain/vehicle | Instrument, main conditions and current status |
|---|---|---|
| Czech Republic — Electromobility Guarantee [5] | Entrepreneurs, zero-emission vehicles. | Loan guarantee and associated grant. The grant cannot be claimed without a loan. Applications are no longer being accepted. |
| Germany — Purchase subsidy [6] | Households; BEVs and eligible PHEVs / range-extended vehicles. | Income-targeted grant from 2026; BEVs: €3,000–6,000 depending on household circumstances. PHEVs are subject to technical conditions. |
| France — Coup de pouce [7] | Individuals selected new BEVs. | Subsidy under the CEE scheme from July 2025. Income, price, environmental score, and origin affect eligibility or the amount of the subsidy. |
| Netherlands — MRB tax discount [8] | Owners of zero-emission passenger vehicles, BEVs / hydrogen vehicles, not PHEVs. | A phased tax rebate of 30 per cent in 2026–2028, 25 per cent in 2029 and 0 per cent from 2030 onwards. |
| China — Purchase tax [10] | Buyers of eligible vehicles: BEVs, PHEVs, FCEVs. | Half the tax in 2026–2027; relief capped at 15,000 CNY per passenger car. This follows on from the exemption in 2024–2025. |
| USA — Federal credits [11] | Previously eligible individuals and businesses purchasing qualifying zero-emission vehicles. | Credits for new, used and commercial vehicles have been discontinued for purchases made after 30 September 2025. State programmes are not included. |
| Canada — EVAP [12] | Individuals, organisations and businesses; BEVs, PHEVs, FCEVs. | Transaction-based grant from 16 February 2026; origin: Canada or a signatory country, and a price cap applies except for vehicles manufactured in Canada. Valid until 31 March 2031 or until funds are exhausted. |
| Japan — CEV [13] | Applicants purchasing an eligible model: BEV, PHEV, FCEV. | Model-specific grant. The 2026 list applies; it does not specify all application conditions and deadlines. |
| India — PM E-DRIVE [14] | Buyers and operators by category: electric two- and three-wheelers, buses and commercial vehicles. | Support for purchase and infrastructure; programme from 2024, deadlines vary by component. This is not a blanket subsidy for private passenger cars. |
| United Kingdom — Electric Car Grant [15] | Buyers of selected new zero-emission passenger cars. | Discount at the dealer of up to 3,750 / 1,500 GBP, depending on the group. Eligible models, range, warranty and sustainability; list status as of September 2026. |
| Norway — VAT exemption [18] | Buyers of eligible electric vehicles. | From 2026, the first NOK 300,000 of the price is exempt; the amount exceeding this limit is subject to 25% VAT. |

Table 2. Comparison of selected electric mobility support schemes as of 16 September 2026. Compiled by the authors based on the sources cited in the individual rows. BEV = battery electric vehicle; PHEV = plug-in hybrid; FCEV = fuel cell vehicle.

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Three key differences emerge from the table. The first is eligibility: the Czech scheme was linked to a business loan, whilst the German programme targets households based on income. The second is technological eligibility: selected programmes in Germany, China, Canada and Japan include PHEVs, whilst the French subsidy is intended for BEVs. The third is the timing and duration of the benefit: the UK subsidy reduces the purchase price, whilst the Dutch relief is reflected in ongoing taxation. The same nominal amount, therefore, does not necessarily imply the same accessibility or impact on the buyer's cash flow [5–8, 10, 12, 13, 15].

For manufacturers, the link between support and the vehicle's origin is significant. France takes into account the place of manufacture of the vehicle and the battery in its subsidy conditions, whilst Canada uses origin directly as a condition of eligibility [7, 12]. These mechanisms must be distinguished from direct subsidies for production capacity. The IEA reports that in 2025, China produced approximately three-quarters of the world's electric passenger cars, whilst the EU produced nearly 3.2 million electric passenger cars. At the same time, the EU remained a net exporter of these vehicles [16]. These figures illustrate the scale of production, not the effect of any specific purchase incentive.

However, the country of origin is not synonymous with the environmental performance of the production process. Atiya and Alkindi [22] propose optimising design and production using an indicator that combines costs and emissions. Their approach supports a multi-parameter assessment of production options. For the interpretation of the rules compared here, this means that the origin requirement must be assessed separately from proven emission savings. Our comparison does not measure these savings.

For supply planning, this implies the need to assess the combination of model, country of origin, customer group and transaction date. The previously announced reductions in Chinese tax relief and the Dutch discount can be incorporated into pricing scenarios; however, the continuation of support cannot be considered guaranteed [8, 10]. The importance of timing is consistent with the conclusions of Hardman et al. [3]. At the same time, income targeting addresses the issue of support availability but does not, in itself, ensure a fair distribution of its actual benefits, as pointed out by Sheldon [17].

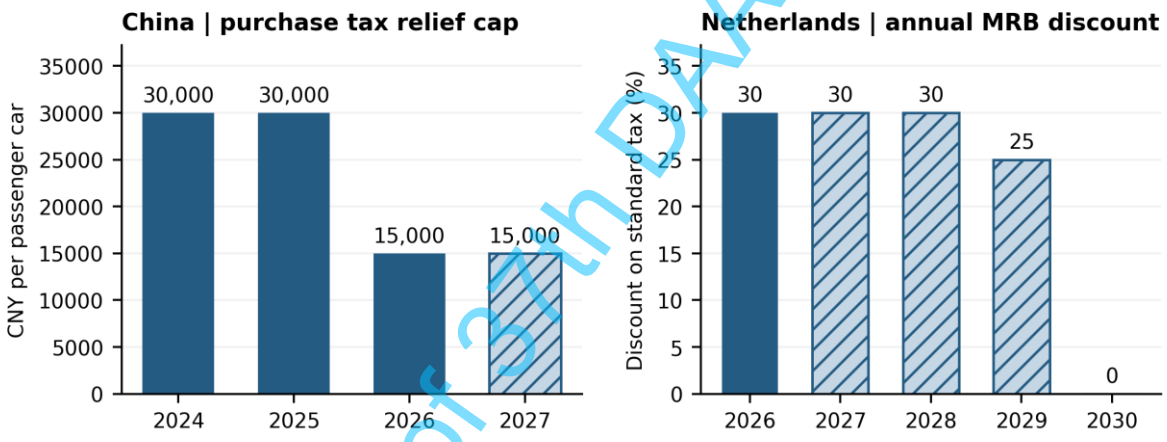


Fig. 2. Announced reductions in two selected incentives. The panels use different units and do not rank overall policy generosity. The Chinese amounts are relief caps, not universal payments—sources: [8, 10]; own visualisation.

Figure 2 shows the announced parameters of two instruments, not a forecast of demand. In the case of China, this refers to the tax relief cap on purchase; for the Netherlands, it refers to a relative discount on current tax. Their differing units make a direct comparison of generosity impossible; however, the time profiles highlight the need to account for both the year of purchase and the period of operation [8, 10].

Limitations include the deliberate selection of programmes, the varying scope of individual instruments, and reliance on publicly available documentation that is updated on an ongoing basis. The matrix does not include all regional incentives, their overlap, the amounts actually paid out, or the full costs to users. India differs from the other cases in the composition of the vehicles supported. Furthermore, the market data for 2025 does not cover the effects of the changes introduced in 2026. It is therefore not possible to rank countries by the effectiveness of their support based on these results. Follow-up research should monitor actual take-up and compare sales trends before and after the change using a comparable control group; for PHEVs, it should also examine the actual proportion of electric driving.

## 6. Conclusion

The comparison answers the research question by distinguishing among recipient eligibility criteria, technological suitability, the method of provision, and the duration of support. These differences cut across geographical regions. Within the EU, common emissions regulations are supplemented by varying national instruments. Nor do countries outside the EU form a uniform model. Furthermore, the French and Canadian cases show that purchase support may be linked to the vehicle's country of origin.

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The contribution of this article lies in a unified comparative matrix that separates the nominal amount of the incentive from the conditions governing its actual use. For the customer, this enables the identification of relevant restrictions. For manufacturers, it defines the variables to include in supply planning and pricing scenarios. The findings represent a synthesis of the rules governing selected schemes, not evidence of their economic or environmental effectiveness. The problem addressed was the difficulty of comparing electromobility incentives across countries when headline subsidy amounts conceal differences in eligibility, supported technologies and timing. It was addressed through a qualitative, document-based comparison of selected programmes in four EU Member States and seven non-EU countries, using a standardised matrix of programme conditions as of 16 September 2026 and 2025 market data solely for context. The findings show that access to support depends on the beneficiary, vehicle type, origin requirements and the form and duration of the incentive; therefore, nominal subsidy values alone are insufficient for comparing programmes or planning vehicle supply. Future research will update the programme matrix, collect data on actual incentive uptake and examine changes in registrations before and after policy revisions against suitable comparison groups, where comparable data are available. It will also consider distributional outcomes across beneficiary groups and, for PHEVs, the share of driving undertaken in electric mode. These steps could support a subsequent assessment of policy effectiveness, which cannot be inferred from the present descriptive comparison.

## 7. Acknowledgements

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