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Fédération Internationale de l'Automobile (FIA) – Region I

Research on the impact of ETS2 on mobility costs

Final Report

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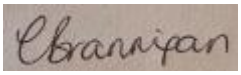
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Executive summary

Introduction and study purpose

The EU's second Emissions Trading System (ETS2) represents one of the most significant policy instruments introduced under European legislation to decarbonise road transport. By placing a carbon price on transport fuels, ETS2 is expected to contribute to emissions reductions while generating revenues to support the transition towards cleaner mobility. However, it will also increase fuel costs for road users, raising important questions about affordability, social equity and public acceptance, particularly for households and communities that rely heavily on private vehicle use.

The recent decision to delay the implementation of ETS2 from 2027 to 2028 has created additional uncertainty regarding the timing and effectiveness of the measures intended to mitigate these impacts. In particular, the deployment of national ETS2 revenues and the Social Climate Fund (SCF) will be critical in ensuring that vulnerable households and road users are adequately protected while maintaining support for the broader decarbonisation agenda. At the same time, ETS2 will interact with a rapidly evolving regulatory landscape, including reforms to vehicle emissions standards and other policies shaping the future of road mobility across Europe. Against this backdrop, FIA commissioned this study to assess the expected impacts of ETS2 on mobility costs, road users and mobility services.

The study examines how ETS2 may affect the affordability and accessibility of mobility across different user groups, the options available to mitigate these impacts, the role of ETS2 revenues and the Social Climate Fund in supporting a fair transition, and its interaction with other EU transport policies.

Key findings

1. ETS2 will increase transport fuel costs, with the greatest impacts falling on car-dependent households.
2. The most vulnerable road users are not defined by income alone.
3. Member States have limited scope to offset ETS2 through fuel tax reductions.
4. Effective use of ETS2 revenues and the Social Climate Fund (SCF) will be critical to protecting vulnerable road users and maintaining public support.
5. ETS2 does not operate in isolation, and its impacts will depend on the wider transport policy framework.

ETS2 impacts on road users and mobility affordability

ETS2 will increase fuel prices across the EU, with diesel prices rising more than petrol prices. ETS2 will raise pump prices by 13-31 ct/l for petrol and 15-37 ct/l for diesel, excluding VAT, depending on the strength of complementary policy. Diesel is expected to experience larger increases than petrol due to its higher carbon content. Under the central scenario (€87/tCO_2), diesel prices increase by 24.2 ct/l compared with 20.7 ct/l for petrol. While implementation has been delayed until 2028, the Social Climate Fund will be available from 2026, providing an opportunity for mitigation measures to be put in place before costs rise.

The impacts of ETS2 will not be evenly distributed across Member States or road users. Exposure generally follows a north-west/south-east gradient, with countries such as Germany, Denmark and the Netherlands less exposed due to higher incomes, stronger EV uptake and existing carbon pricing frameworks. By contrast, countries such as Greece, Croatia and Portugal are expected to be more exposed due to lower income resilience, higher fuel expenditure shares and more limited transition capacity.

Vulnerability to ETS2 is determined by mobility circumstances as much as income. The greatest pressures often fall on lower-middle-income households that depend on petrol or diesel vehicles but have limited opportunities to switch to electric vehicles or public transport. Carless households may also be affected as higher mobility costs can further restrict access to transport and place car ownership further out of reach.

Three groups face particular challenges:

- **Low-income, car-dependent households** face the clearest affordability risk. Many rely on older, less efficient vehicles while having limited access to finance and affordable second-hand electric vehicles.
- **Rural households and farmers** are more exposed due to longer travel distances, higher vehicle dependence and limited public transport alternatives. Farmers face additional challenges because fuel is a production cost that cannot easily be passed on to consumers.
- **Users with limited access to alternatives**, including shift workers, apartment dwellers, people with reduced mobility and self-employed van users, may be unable to switch where suitable charging infrastructure, public transport or electric vehicles are unavailable.

Options to mitigate impacts and support a fair transition

Member States have limited scope to use fuel tax reductions to offset ETS2-related fuel price increases. Existing EU minimum tax rates constrain broad-based relief measures, and the proposed revision of the Energy Taxation Directive (ETD) is likely to further restrict flexibility. While some Member States may be able to reduce duties where national rates exceed EU minima, wider reductions generally require specific authorisation. Excise duties and ETS2 carbon costs are separate, additive components of fuel prices. The proposed ETD revision would further constrain broad tax reductions through energy-content-based taxation, rate ranking, indexation and higher minimum rates, while retaining more targeted relief for vulnerable groups.

Most viable mitigation options lie outside fuel taxation. Across the EU, Member States are primarily relying on measures such as public transport support, vehicle taxation reforms, cleaner-vehicle subsidies and investment in charging infrastructure to cushion ETS2 impacts and support the transition to low-carbon mobility.

Broad price reductions can provide rapid relief but weaken the carbon-price signal and disproportionately benefit higher-consuming households. Targeted compensation is potentially more progressive but requires effective identification of beneficiaries and administrative capacity. Structural measures offer more durable protection by reducing fossil-fuel dependence, although many require sustained public funding and accessible low-carbon alternatives.

ETS2 revenues and the Social Climate Fund will play a central role in supporting vulnerable road users and financing the transition. Member States have significantly greater flexibility in the use of ETS2 revenues retained at national level than for revenues channelled through the Social Climate Fund, which can only be spent through approved Social Climate Plans (SCPs). However, uncertainty remains regarding how Member States can demonstrate compliance with the Article 30d(6) “equivalent financial value” requirement.

Delays to ETS2 implementation and uneven progress in SCP preparation could affect the timing and availability of funding, investment planning and delivery of measures. The findings highlight that access to SCF resources is closely linked to SCP approval and implementation. Delays can therefore create uncertainty around funding availability and investment decisions, underlining the importance of early planning, clear governance arrangements and complementary funding mechanisms to ensure continuity of support and implementation.

ETS2 in the wider transport policy framework

ETS2 will not operate in isolation, and its impacts on road users will be shaped by the wider EU transport policy framework. Policies that accelerate the uptake of zero- and low-emission vehicles, support charging infrastructure deployment and reduce fossil fuel demand are likely to moderate ETS2 cost pressures over time, while policies that delay these transitions may prolong consumers' exposure to higher fuel costs.

Measures such as corporate fleet targets, renewable energy incentives, recharging infrastructure requirements and vehicle information measures are likely to reduce ETS2 allowance demand and ease cost pressures on road users by accelerating the shift away from fossil fuels. Conversely, regulatory flexibilities that delay vehicle electrification may slow emissions reductions and prolong reliance on petrol and diesel vehicles.

The extent to which ETS2 affects consumers will therefore depend not only on the carbon price itself, but also on how effectively complementary policies accelerate the transition to cleaner mobility. The overall impact will depend on the final design of these instruments and the pace at which they translate into lower fossil fuel use across the transport sector.

1. Introduction

This is the Final Report for "*Research on the impact of Emission Trading Scheme 2 (ETS2) on mobility costs*". The report includes chapters on each of the tasks explored. The report is therefore structured as follows:

- Expected energy and fuel price impacts in a delayed ETS2 context (Task 1) (Section 2)
- Policy tools, revenue use and uncertainty around the Social Climate Fund (Task 2) (Section 3)
- Interaction of ETS2 with other EU transport legislation (Task 3) (Section 4)
- Consumer impact, equity considerations and end-user perspective (Task 4) (Section 5)
- References
- Annexes

1.1 Background

The introduction of the second EU Emissions Trading System (ETS2) represents a major step in the European Union's long-term strategy to decarbonise road transport. Once in force, ETS2 will introduce carbon pricing for road transport fuels, with both direct and indirect consequences for fuel prices, household transport expenditure and the affordability of mobility services[1]. These impacts will not be uniform. Member States (MS) that already apply national carbon pricing mechanisms may experience more moderate changes, while others, where carbon pricing for road transport is new, could see more pronounced cost increases. These differences heighten concerns around equity, public acceptability and regional disparities in mobility affordability.

The auctioning of ETS2 allowances, initially planned to start in 2027 and postponed to 2028, will generate revenues that Member States (MSs) are required to use to support decarbonisation solutions and protect vulnerable households and road users. National revenues - representing 75% of the total revenues from the auctions – are expected to be used on "Green Transition" goals including, in the case of transport, investment on public transport infrastructure to provide alternatives to private car use, development and promotion of the adoption of new low emission technologies in the road transport and measures to promote just transition (including training and upskilling workers in sectors affected by the move away from fossil fuels).

Complementary to the national revenues, 25% of the total revenues from auctions are allocated to the newly created Social Climate Fund (SCF[2]) (Regulation (EU) 2023/955), intended to cushion the impact on those likely to struggle most by rising energy and fuel prices as a result of the ETS2. SCF funds can be used to finance measures promoting sustainable transport (including promotion of low- or zero-emission vehicles and active mobility measures) but also include direct income support to compensate for the expected increase in road transport fuel prices.

Crucially, Article 30d(6) of the ETS2 Directive includes a priority clause that mandates that while using the funds for the range of activities identified above, Member States must prioritise activities that address social aspects, by focusing on more vulnerable households and road users.

Furthermore, an important precondition for utilising the revenues is the development by Member States of Social Climate Plans (SCPs) detailing their measures and investments, developed through consultations with local authorities, social partners and civil society. The SCP should illustrate how funds – both national revenues and via SCF funding - are expected to be used and illustrate how the priority clause is taken into account. So far, only five plans have been formally adopted and five more are in the stage of assessment by the Commission[3] while tracking and assessment of draft plans are also available[4]. Such delays pose significant questions on the effectiveness of the funding mechanisms in place for mitigating the impacts of the ETS2.

[1] COMMISSION STAFF WORKING DOCUMENT (SWD/2021/601 final) - Impact assessment report accompanying the document DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, EUR-Lex - 52021SC0601 - EN - EUR-Lex

[2] https://employment-social-affairs.ec.europa.eu/policies-and-activities/funding/social-climate-fund_en

[3] On September 1st 2026, only Croatia, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Slovenia and Sweden have submitted their SCPs. Social Climate Fund national plans - Employment, Social Affairs and Inclusion

[4] Social Climate Fund - REScoop

The ETS2 also does not operate in isolation. It complements other policies set out in the European Green Deal[5], intersecting with broader reforms shaping the future of mobility, including the recently published Automotive Package[6] (December 2025) and the ongoing revisions to CO_2 emission standards for cars and vans (Regulation (EU) 2023/851). Evolving vehicle standards may alter how quickly consumers feel the impact of ETS2. Policy shifts such as increased regulatory flexibility, a stronger focus on affordability, and considerations of lifecycle emissions may influence future vehicle fleets, emissions pathways and consumers' exposure to carbon pricing. Understanding these interactions is critical to assessing the cumulative impact of multiple policy instruments on road users.

Furthermore, a political agreement was reached in December 2025 on the legally binding 2040 climate target[7] on achieving economy-wide greenhouse gas (GHG) emission reductions by 90% from 1990 level, a fundamental milestone in working towards the EU's climate neutrality goal for 2050. As part of this agreement, it was announced that the start date for ETS2 would be postponed for one year until 1st January 2028, primarily to provide Member States with more time to prepare for its implementation and a smoother transition to carbon pricing for consumers.

The decision to delay ETS2 to 2028 has placed the scheme within an increasingly fluid regulatory and political context. Uncertainties remain around how corresponding social measures, particularly the SCF, will be timed and financed, creating questions about how effectively vulnerable households will be supported as carbon pricing begins to influence mobility costs. Without timely and well-designed mitigating actions, certain end users, especially vulnerable households and those dependent on private car travel, are likely to face rising mobility costs.

The recent study prepared by Ricardo for the European Commission[8] explored the supporting measures that can promote rapid decarbonisation in the sectors covered by ETS2, including road transport. Most of the road transport measures considered focused on improving charging infrastructure and reducing the higher upfront costs of low emission vehicles through incentives and regulatory standards. These policies are essential to accelerate electrification, given that road transport accounts for the majority of transport emissions. In the shorter term, several measures also promote modal shift towards cycling, public transport and rail to reduce reliance on private cars. Longer term decarbonisation will require further investment in public transport networks, intermodal hubs and shared or rail-based mobility infrastructure. The study demonstrated how Member State measures and targeted use of resources can support early decarbonisation under ETS2 while protecting low- and middle-income groups. Building on these examples through coherent national strategies and long-term planning will be essential to provide stability for households, communities and businesses as they adopt low carbon technologies.

1.2 Study objectives

In view of the above, the objective of the study commissioned by FIA was to provide an evidence-based analysis of the expected impacts of the implementation of ETS2 on road users. It aligns with FIA Region I's mission to represent the interests of road users and to promote sustainable, affordable, fair and technologically open mobility across Europe

The study pays particular focus to the impacts of the ETS2 on fuel prices, the distributional effects and its implications for the different types of road users in terms of affordability, accessibility and choice. It examines the role of policy tools available to Member States via the use of ETS2 revenues and the Social Climate Fund intended to mitigate adverse effects on consumers while supporting emissions reductions, including the practical implications of the priority clause of ETS Directive for the use of revenues for social and climate-related purposes.

In doing so, the study considers the implications of the delayed implementation of the ETS2 and the uncertainties around the mechanisms to fund the accompanying policy tools – particularly those related to the implementation of the Social Climate Fund. It also examines the implications of the relevant regulatory context, with focus on the set of recent EC initiatives in the Automotive Package, particularly the proposal for a revision of the CO_2 standards for LDVs and the flexibilities introduced as well as other possibly relevant initiatives such as the proposed Directive on Corporate Fleets.

[5] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en
[6] https://transport.ec.europa.eu/transport-themes/action-plan-future-automotive-sector/automotive-package_en
[7] https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2040-climate-target_en
[8] https://op.europa.eu/en/publication-detail/-/publication/2d8c3aa1-91dd-11f0-97c8-01aa75ed71a1/language-en

2. Expected energy and fuel price impacts in a delayed ETS2 context (Task 1)

2.1 Introduction

This chapter assesses the expected impacts of ETS2 on fuel and energy prices and the implications for households across the European Union, taking into account the delayed implementation timeline. It combines evidence from existing literature, quantitative analysis and policy review to provide a comprehensive view of how carbon pricing in road transport may affect mobility costs.

The analysis is structured in two complementary parts.

- Subtask 1.1 focuses on estimating ETS2-induced fuel price increases and examining how these translate into differentiated impacts across Member States, income groups and mobility profiles.
- Subtask 1.2 then reviews the policy tools available to mitigate these impacts, including national measures and the role of fuel taxation under the Energy Taxation Directive (ETD).

Together, these elements provide an integrated framework to understand both the scale of ETS2-related price effects and the distribution of their impacts, as well as the policy options available to support a fair and affordable mobility transition.

2.2 Subtask 1.1: Expected impact of ETS2 on fuel and energy prices

This subtask provides a structured assessment of how ETS2 is expected to affect fuel prices and how these price changes translate into impacts for households across the EU. The analysis follows a stepwise approach that progressively moves from an EU-wide price signal to differentiated real-world impacts across countries and consumer groups.

- **Step 1** establishes the scale of the ETS2 price signal, drawing on existing literature to define plausible carbon price scenarios and translating these into expected increases in retail petrol and diesel prices. This provides a common analytical baseline for the rest of the assessment.
- **Building on this, Step 2** examines how this common price increase translates into different levels of exposure across Member States. It shows that the impact of ETS2 is shaped not only by the price itself, but by underlying structural and socio-economic factors such as fuel consumption, income levels, existing fuel expenditure burdens, electrification levels and policy context. This step therefore explains why a uniform EU-wide carbon price leads to heterogeneous impacts across countries.
- **Step 3** then shifts the focus to the distribution of impacts within Member States, assessing how different income groups, territories and mobility profiles are affected. It highlights that vulnerability to ETS2 is not determined by income alone, but by the interaction between economic constraints, dependence on fossil-fuel mobility and access to alternatives.

Taken together, the three steps build a coherent narrative: from price formation (Step 1), to cross-country exposure (Step 2), to household-level vulnerability (Step 3). This approach ensures that ETS2 impacts are understood not as a single average effect, but as a set of differentiated outcomes driven by structural, socio-economic and behavioural factors.

2.2.1 Step 1: Targeted literature review and scenario extraction

Step 1 consists of a structured and targeted literature review of modelling studies, policy analyses, market outlooks and institutional reports assessing the expected price implications of ETS2. The objective is to consolidate evidence on ETS2 carbon price assumptions, implementation timelines, retail fuel-price impacts and Member State differences, and to use this evidence to define a set of credible ETS2 price scenarios for the subsequent impact assessment.

The review starts from the sources identified in the proposal and is complemented with additional recent literature, including academic articles, European Commission documents, market forecasts and reports from specialised policy organisations. This ensures that the evidence base captures more recent developments, including updated implementation timelines, external price forecasts and distributional evidence.

For each relevant source, information is extracted against four dimensions:

- Assumed ETS2 carbon price levels, including source-defined scenarios, price paths, forecasts, averages, peaks and regulatory reference values;
- Implementation timelines, including the original 2027 implementation assumption and more recent references to a delayed 2028 start;
- Resulting projected increases in retail fuel;
- Differences across Member States, where modelled or discussed, including structural factors such as existing fuel taxation, income levels, fossil-fuel dependence and transport vulnerability.

All the sources revised are detailed in Annex 7.1.

ETS2 price assumptions

Some of the sources reviewed provide quantitative assumptions for future ETS2 carbon prices. These values differ substantially across studies, reflecting different assumptions on policy effectiveness, complementary measures, market scarcity, energy-efficiency progress, electrification uptake and price-stabilisation mechanisms.

The objective of this step is to consolidate the reported ETS2 price assumptions into a comparable evidence base. **Prices are rebased to approximate €2024/tCO_2,** using Eurostat Database[9] for inflation rates**.** Where no explicit price basis is specified, the reported monetary value is assumed to correspond to the price level of the reference year associated with the reported scenario or estimate.

It is important to distinguish between the scenario labels used by individual sources and the analytical grouping applied in this report. Some sources define explicit scenario categories, such as low, high, baseline or policy-specific cases. Others do not present discrete scenarios as such, but instead report price paths, forecast ranges, average or peak prices, regulatory benchmark values, or market-based estimates. For this reason, source-specific terminology has been retained in the evidence base in order to preserve the original framing and assumptions of each study. At the same time, an analytical price grouping was applied across all sources to enable comparison and to support the construction of the final ETS2 scenarios used in this analysis.

The dominant pattern identified across sources is that **lower or moderate ETS2 price assumptions are generally associated with stronger complementary policies, such as energy efficiency measures, electrification support, renewable deployment, revenue recycling, behavioural change, and price-containment mechanisms**. In these cases, emissions reductions are delivered through a broader policy mix, which reduces allowance demand and limits upward pressure on the ETS2 price.

By contrast, **higher ETS2 price assumptions are more often associated with weaker or less effective complementary policies, slower technology uptake, delayed decarbonisation, tighter allowance scarcity, or a greater reliance on carbon pricing as the main driver of emissions reductions**. In other words, higher prices often reflect scenarios in which the carbon market is required to do more of the adjustment because other policy instruments or market conditions do less to reduce emissions at lower cost.

Further details on how each source defines its scenarios are provided in Annex 7.1.

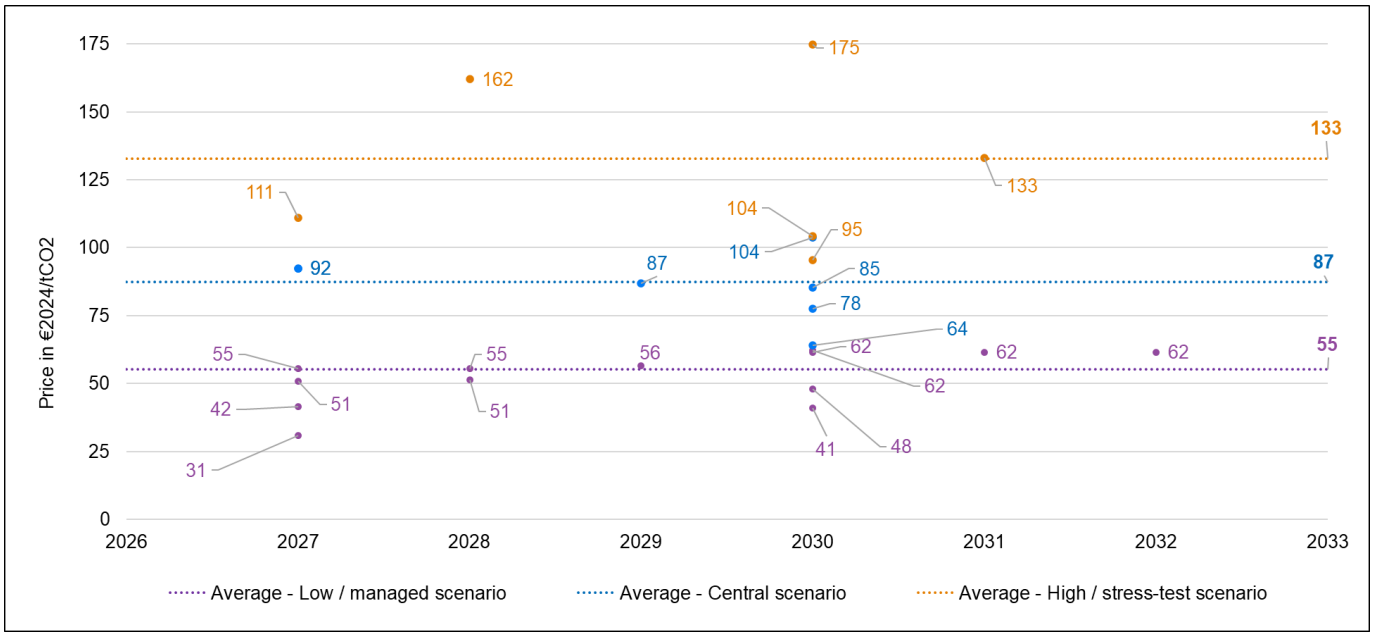
The analytical price grouping is used for cross-source comparison and scenario design. It does not necessarily correspond to the scenario label used by the original source. Some values represent source-defined scenarios, while others are price path points, averages, peaks, external forecasts or reference values. Prices are reported as stated in the original sources; adjusted €2024 values are used in the subsequent figure where possible.

Some sources report ETS2 prices in €/tCO_2e rather than €/tCO_2. For the purpose of this analysis, these values are treated as comparable, as ETS2 price impacts on road fuels are calculated using CO_2 emissions from fuel combustion. The original unit is retained in the evidence base where relevant.

Based on the consolidated evidence, the ETS2 price values retained for the analysis, expressed in €2024 terms, are presented in Figure 2-1.

[9] Eurostat Database - HICP - inflation rate: https://ec.europa.eu/eurostat/databrowser/view/tec00118/default/table?lang=en
Prices projections above 2025 were estimated based on the average inflation rates from 2015 to 2025.

Figure 2-1. ETS2 price assumptions range widely across studies and scenarios



Source: WSP elaboration based on ETS 2 prices from the references in Table 7-2

Note: Dotted lines represent the average ETS2 price retained for each analytical scenario and are shown as constant reference values. They are used as inputs for the subsequent retail fuel-price impact assessment and should not be interpreted as year-specific ETS2 price forecasts.

Based on this evidence, three analytical ETS2 price scenarios are retained for the subsequent assessment of retail fuel-price impacts. These scenarios are not intended to replicate any single source forecast. Rather, they synthesise the range of values reported in the literature into three policy-relevant price environments: a low / managed scenario, a medium scenario and a high / stress-test scenario (see Table 2-1).

Table 2-1. ETS2 price scenarios retained for retail fuel-price impact assessment[10]

Scenario retained for analysis	ETS2 value, €2024/tCO_2	Interpretation
Low / managed scenario	€55/tCO_2	**Represents a managed-transition scenario**. It assumes effective complementary policies, revenue recycling, technology support and price-containment mechanisms that reduce aggregate allowance demand and keep ETS2 prices around the moderate reference range.
Medium scenario	€87/tCO_2	**Represents a partial-delivery scenario.** Transport policies may remain broadly in place, but complementary policies across ETS2-covered sectors, particularly buildings, heating, energy efficiency and renewable deployment, do not fully reduce fossil-fuel demand.
High / stress-test scenario	€133/tCO_2	**Represents a stress-test scenario** in which ETS2 prices rise materially due to weaker or delayed complementary policies, slower technology deployment, persistent fossil-fuel demand and/or tighter allowance scarcity.

Implementation timeline

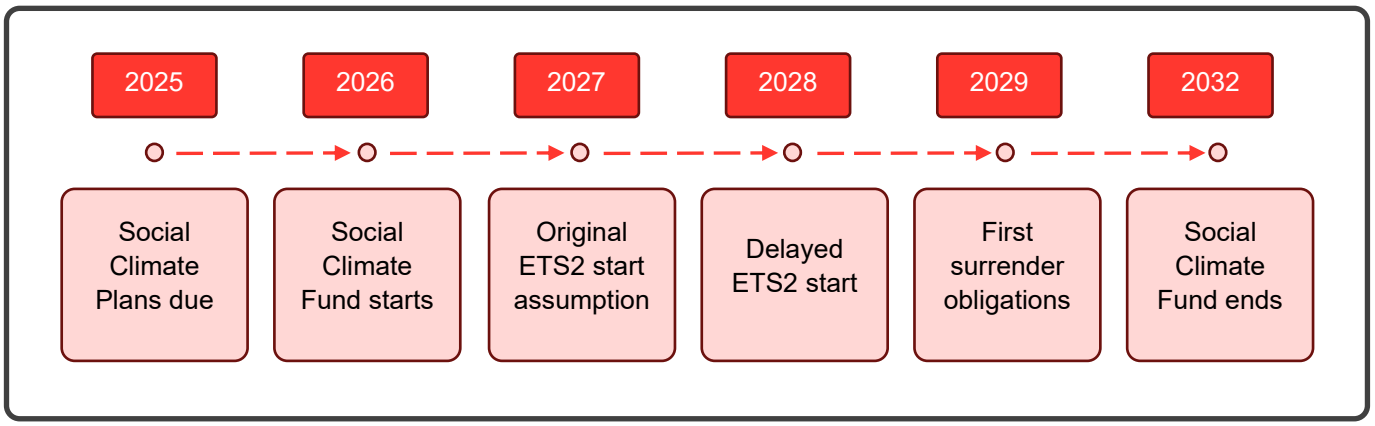
The reviewed sources generally converge on the main ETS2 and Social Climate Fund (SCF) milestones, although there is an important distinction between earlier sources, which typically assume ETS2 implementation in 2027, and more recent sources, which reflect or discuss a one-year delay to 2028. The SCF is expected to start before the full ETS2 price impacts materialise, with the aim of supporting vulnerable households, transport users and micro-

[10] Where very high ETS2 price assumptions were found in literature (e.g.: 261€2022/tCO2 (T&F 2026); 259 €/tCO2 (EP 2025); 206€/tCO2 (EWI 2025); 200 €/tCO2 (Bruegel 2025)) they have been acknowledged but not used in the core analysis, as they generally reflect extreme, long-run or upper-bound stress-test cases rather than central policy-relevant outcomes. They are therefore retained as tail-risk evidence only.

enterprises during the transition. The European Commission's SCF page states that ETS2 will be introduced in 2028, while the SCF will operate from 2026 to 2032. Member States were required to submit their Social Climate Plans by 30 June 2025 (European Commission, 2026).

For the purposes of this analysis, the implementation timeline is used mainly to frame when ETS2-related retail fuel-price impacts may begin to materialise. Earlier modelling sources such as CE Delft, Bruegel, ECCO, T&E, BloombergNEF and EWI generally use 2027 as the implementation assumption, while newer institutional and policy sources increasingly reflect the postponed 2028 start. The EEA's 2026 briefing states that EU co-legislators agreed in November 2025 to delay ETS2 by one year, from 2027 to 2028, while confirming that the Social Climate Fund is in force and running from 2026 (European Environment Agency, 2026).

Figure 2-2. ETS2 and Social Climate Fund implementation milestones



This timing distinction is used in the following analysis to frame when ETS2-related road fuel-price impacts may begin to affect consumers.

Resulting projected increases in retail fuel prices

Having defined the ETS2 price scenarios, the next step is to translate these carbon prices into expected retail fuel-price impacts. ETS2 applies upstream to fuel suppliers, but the cost of allowances is expected to be largely passed through to final consumers through higher petrol and diesel prices.

The reviewed sources show a broadly linear relationship between the ETS2 carbon price and the increase in retail fuel prices. This is expected because the price impact is mainly driven by the carbon content of each fuel: for a given ETS2 price in €/tCO_2, fuels with higher emissions per litre face a higher price increase. Diesel therefore shows a slightly higher increase per litre than petrol.

Figure 2-3. Relationship between ETS2 carbon price and petrol retail-price impact

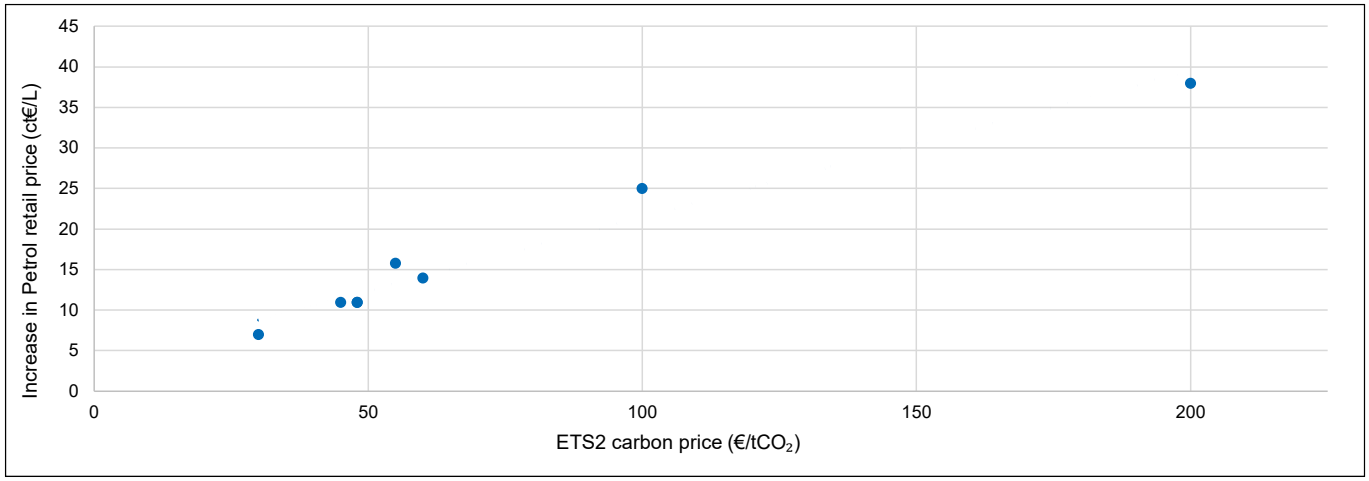
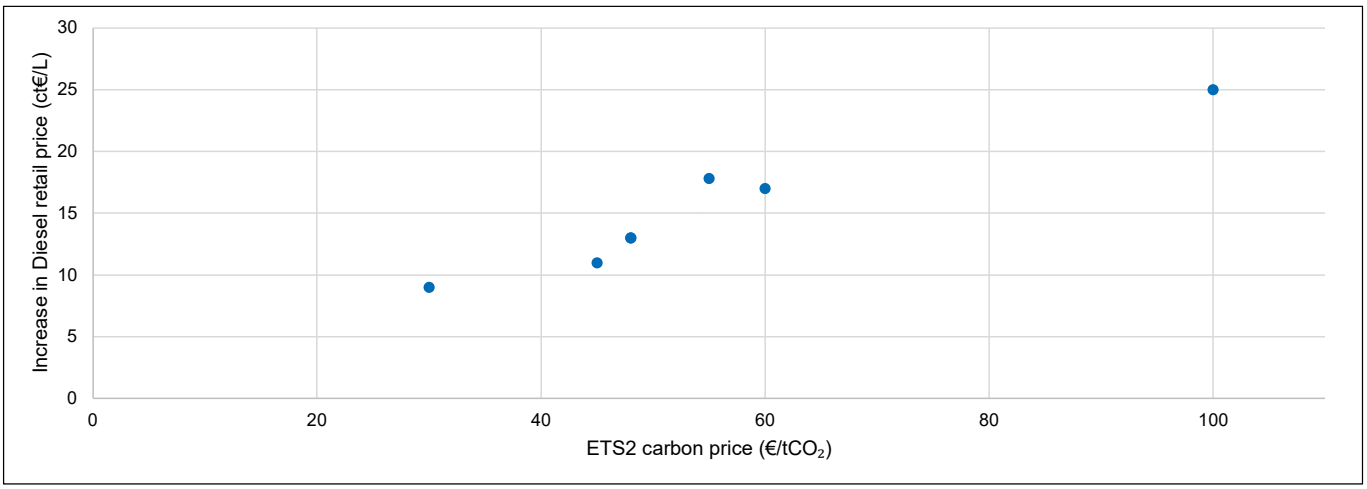


Figure 2-4. Relationship between ETS2 carbon price and diesel retail-price impact



Source: WSP elaboration based on data from the references in Table 7-2

Note: Each dot represents a source estimate linking an ETS2 carbon price to a petrol or diesel retail price impact. The dotted line shows the fitted linear relationship used to derive average conversion factors for the analysis.

Based on the reviewed source estimates, the average impact of a €1/tCO_2 increase in the ETS2 carbon price is estimated at approximately:

- **Petrol:** +0.24 ct€/l
- **Diesel:** +0.28 ct€/l

Applying these conversion factors to the three ETS2 price scenarios retained for the analysis gives the indicative retail fuel-price impacts shown in Table 2-2.

Table 2-2. Estimated ETS2 impact on petrol and diesel retail prices (excluding VAT effects)[11]

Scenario	ETS2 price, €2024/tCO_2	Impact on petrol, ct€/l	Impact on diesel, ct€/l
Low	55	13.1	15.3
Medium	87	20.7	24.2
High	133	31.4	36.8

Source: WSP elaboration

These estimates suggest that ETS2 could lead to material increases in road fuel prices, particularly under the Medium and High scenarios. The impact is expected to be higher for diesel than for petrol. In the short run, the burden is likely to be most significant for households and businesses with high fuel consumption, limited ability to reduce car use, or limited access to low-carbon transport alternatives. This is reinforced by evidence that road-fuel demand is relatively inelastic in the short run, meaning that consumers may not be able to adjust fuel consumption quickly when prices rise. Differences across Member States and exposed user groups are discussed more in detail in the following sections (step 2 and step 3).

2.2.2 Step 2: Differences across Member States

This section provides a high-level overview of Member State exposure to ETS2, with the aim of contextualising how carbon pricing on transport fuels may affect households across the European Union. The analysis adopts a descriptive and comparative approach, focusing on broad patterns of fuel use, socio-economic conditions, and technological adoption, without seeking to model behavioural responses or quantify precise impacts.

[11] Note: Estimates reflect the direct pass-through of ETS2 compliance costs to fuel prices. The full impact on final consumer prices would be higher, as VAT is also applied to the ETS2-related price increase.

The literature does not provide the same level of Member State detail across all sources. Some sources provide explicit cross-country or regional evidence, while others are EU-wide, country-specific or mainly explanatory.

For this reason, to capture the main drivers of cross-country variation in exposure, the analysis below combines:

- insights from the literature; and
- a structured indicator-based approach.

Evidence from the literature

The reviewed literature highlights that ETS2 impacts are shaped by a set of recurring structural and socio-economic drivers. To improve clarity and coherence, the evidence is synthesised below across a number of key thematic dimensions. These themes provide the analytical basis for the structured indicator-based approach developed in the following section.

Overall, the literature consistently highlights that exposure arises from an interaction between fuel dependence, income constraints and access to alternatives, rather than from any single factor in isolation.

Differences in baseline socio-economic conditions and affordability

The reviewed evidence shows that ETS2 impacts are unlikely to be uniform across Member States, even though the ETS2 applies a single EU-wide carbon price. Differences in existing national fuel taxes and carbon-pricing levels, household energy-expenditure shares and income levels mean that the same ETS2 price may translate into different affordability impacts depending on each country's fiscal and socio-economic starting point. Lower-income Member States may therefore experience higher relative pressure from comparable fuel-price increases (European Commission, 2021).

Member State differences are also relevant because baseline transport vulnerability varies across countries. In 2023, among people at risk of poverty, defined as those living below 60% of median equivalised income, the share of those unable to afford a car differed substantially across Member States, ranging from around 6% in Italy, Cyprus and Malta to more than 30% in Finland, Romania, Slovakia and Hungary. This indicates that, in some Member States, a significant share of already income-vulnerable people may face mobility constraints, even before considering additional affordability pressures under ETS2 (European Commission, 2025).

Structural drivers of transport vulnerability and exposure

Exposure to ETS2 is strongly influenced by structural transport characteristics, including **car dependence and access to alternatives**. The highest-risk profiles combine low income, fossil-fuel car ownership and limited mobility provision, with limited mobility provision defined by low public transport accessibility, above-average distance to services and/or above-average fuel costs. In the Netherlands, this group is estimated at 111,000–247,000 households in 2030, illustrating that exposure depends not only on fuel use, but also on the availability of alternatives (CE Delft, 2025).

Car-dependent households are more exposed where public transport access is limited, especially in rural or lower-density areas However, urban location does not eliminate exposure, as more than 60% of distances travelled are by car in most European cities (Bruegel, 2025).

These dimensions are explored further in Step 3 through a consumer-level impact assessment.

Existing policy frameworks and carbon pricing context

The existing carbon pricing and fuel taxation framework is a key determinant of how ETS2 will be experienced across Member States. A harmonised carbon price can translate into different effective impacts because Member States already differ in national fuel-tax levels, existing carbon-pricing frameworks and household energy-expenditure structures. These pre-existing fiscal differences mean that ETS2 will not be introduced on a uniform baseline across countries (European Commission, 2021)

National preparedness for ETS2 also differs significantly. In the wider EEA (European Economic Area)/ Swiss context, only a limited number of jurisdictions already apply carbon pricing to road transport, and only a smaller subset apply prices at levels comparable with expected ETS2 prices. This suggests that ETS2 may represent a more visible new price signal in countries without comparable existing schemes (BloombergNEF, 2025).

Member State differences may also influence ETS2 price formation, not only the distribution of impacts. ETS2 prices depend on decarbonisation progress across the EU27, particularly in high-emitting countries such as Germany, Italy, Poland, France and Spain. If decarbonisation in these countries is slower, allowance demand may remain higher, increasing pressure on the EU-level ETS2 price faced by all Member States (ECCO, 2025).

Box 1: How the ETS2 price emerges

ETS2 is a cap-and-trade system: **it fixes the total quantity of allowances available each year** for road transport, buildings and small industry. All allowances are auctioned, and fuel suppliers must buy and surrender them (European Commission, 2025).

The price emerges from the market, determined by the fixed supply (the cap) and the demand for allowances, which reflects firms' abatement costs (Gunther, Pahle, Govorukha, Osorio, & Fotiou, 2026). Although Member States auction allowances separately, they do so under common EU rules and allowances are tradable across the Union, so the price converges to a single EU-wide level (European Commission, 2024).

Because the cap is set for the EU as a whole, **decarbonisation in one Member State affects the price faced by all the others**.

Demand for allowances comes disproportionately from the largest-emitting countries, Germany, Italy, Poland, France and Spain, **so their pace of abatement drives the EU-wide price**. If these countries decarbonise slowly, their fuel suppliers keep buying allowances against a fixed cap, holding demand and the price high for everyone; if they abate faster, EU-wide demand falls and the price eases (ECCO, 2025).

Building on the evidence presented above, the literature review identifies a consistent set of key dimensions shaping Member State exposure to ETS2, including fuel consumption and car dependence, household income and affordability, fuel expenditure burden, access to alternative mobility options, and existing carbon pricing and taxation frameworks. These themes provide the conceptual foundation for the structured indicator-based approach developed in the following section.

Structured indicator-based approach

As a preliminary step, the analysis translates the ETS2-induced fuel price increases identified in Step 1 into indicative impacts on average household fuel expenditure across Member States. While the price increase in €/l is assumed to be broadly uniform across the EU, differences in average household fuel consumption result in varying levels of absolute cost increases at country level.

To capture this effect, average household fuel consumption is combined with the estimated ETS2 price increase to derive an indicative **annual additional fuel expenditure per household (€ per year)**. This provides a simple translation of the EU-level carbon price signal into country-specific orders of magnitude, illustrating how the same price increase may result in different levels of additional costs across Member States.

This calculation is based on national averages and therefore does not capture the substantial variation in income, consumption patterns and mobility needs within countries. As such, it should be interpreted as an **illustrative indicator of the scale of the price shock**, rather than a measure of distributional impacts or household vulnerability. A more detailed assessment of how these impacts differ across income groups and households will be developed separately (see Task 4). The results presented here are therefore used solely to contextualise the magnitude of ETS2-related cost increases ahead of the exposure analysis.

Building on this, the analysis then adopts a structured approach to assess the multidimensional nature of exposure to ETS2. The assessment is organised in two steps. The first step focuses on **underlying household exposure**, reflecting structural dependence on fossil fuels and the economic capacity to absorb higher costs. The second step builds on this baseline by incorporating **transition capacity and policy context**, which together determine the extent to which the introduction of ETS2 is likely to generate additional price signals and impacts across Member States.

In the first step, a composite indicator of baseline exposure is constructed using three complementary dimensions.

- The first dimension captures **structural exposure**, proxied by transport fuel consumption per household, expressed in gigajoules. This reflects the extent to which households rely on fossil fuels for mobility and therefore the volume of emissions that will be subject to carbon pricing under ETS2. Higher levels of fuel consumption indicate stronger dependence on private vehicle use and greater direct exposure to fuel price increases.
- The second dimension reflects **economic resilience**, proxied by median household income expressed in purchasing power standards. This captures differences in households' ability to absorb higher fuel costs. Higher income levels are associated with greater capacity to cope with price increases, whereas lower-income households are more vulnerable to energy price shocks and may experience more significant welfare impacts.

- The third dimension captures the **observed fuel burden**, measured as household expenditure on transport fuels as a share of total household expenditure. This indicator reflects the importance of fuel costs within household budgets and provides an empirical measure of current financial pressure. While closely related to both fuel consumption and income, it captures realised outcomes and therefore offers a complementary perspective on exposure.

Each of these indicators is categorised into terciles across Member States and assigned a score from one to three, where higher values correspond to a greater contribution to baseline exposure. These scores are aggregated to produce an **underlying exposure index**, which reflects the combined effect of fuel dependence and economic vulnerability.

The analysis also presents indicative information on **fuel price levels across Member States**. Fuel prices are an important determinant of household expenditure and of the potential pass-through of carbon costs. However, they are not included directly in the composite indicators developed in this section. This reflects the fact that price levels are influenced by a combination of market conditions, taxation and short-term policy measures, and therefore may not fully capture structural differences in exposure. Instead, price variations are used to support the interpretation of observed patterns, particularly where expenditure levels do not align fully with differences in consumption and income.

In the second step, this baseline measure is complemented with two additional dimensions that shape the extent to which ETS2 will translate into effective impacts.

- The first is **transition capacity**, measured through the share of electric vehicles in the national vehicle stock. Higher levels of electrification reduce dependence on fossil fuels and therefore mitigate exposure to carbon pricing over time, while low EV uptake indicates stronger structural lock-in.
- The second is the **existing carbon pricing and fuel taxation framework**. Member States differ significantly in the extent to which transport fuels are already subject to explicit carbon pricing, through instruments such as carbon taxes or national emissions trading systems. In countries where such mechanisms are already in place, ETS2 is likely to reinforce or extend existing price signals. By contrast, in Member States relying primarily on excise duties without explicit carbon pricing, the introduction of ETS2 may represent a more substantial shift in the pricing of emissions.

These two additional dimensions are combined with the baseline exposure index to derive an overall classification of **adjusted exposure to ETS2**, capturing not only underlying vulnerability but also the capacity of households to adapt and the policy context in which ETS2 will be implemented.

To complement the quantitative analysis, this section includes a review of the available literature on ETS2 impacts. This evidence base highlights additional dimensions of variation across Member States, including differences in transport poverty, accessibility of alternatives, and the role of large emitting countries in shaping ETS2 price dynamics. While not directly integrated into the composite indicators, this literature provides an important contextual layer, supporting the interpretation of the results and informing the subsequent assessment of distributional and consumer-level impacts.

Translating ETS2 price increases into average household fuel expenditure

Building on the ETS2 price scenarios defined in Step 1, this section provides a translation of the estimated fuel price increases into indicative impacts on **average household fuel expenditure** across Member States, and situates these impacts within the broader context of existing fuel price levels.

As discussed previously, the ETS2-induced price signal is assumed to be broadly uniform across the EU, reflecting the carbon content of fuels and the pass-through of carbon costs to retail prices. However, the **financial implications of this increase differ across countries**, primarily due to variations in average household fuel consumption.

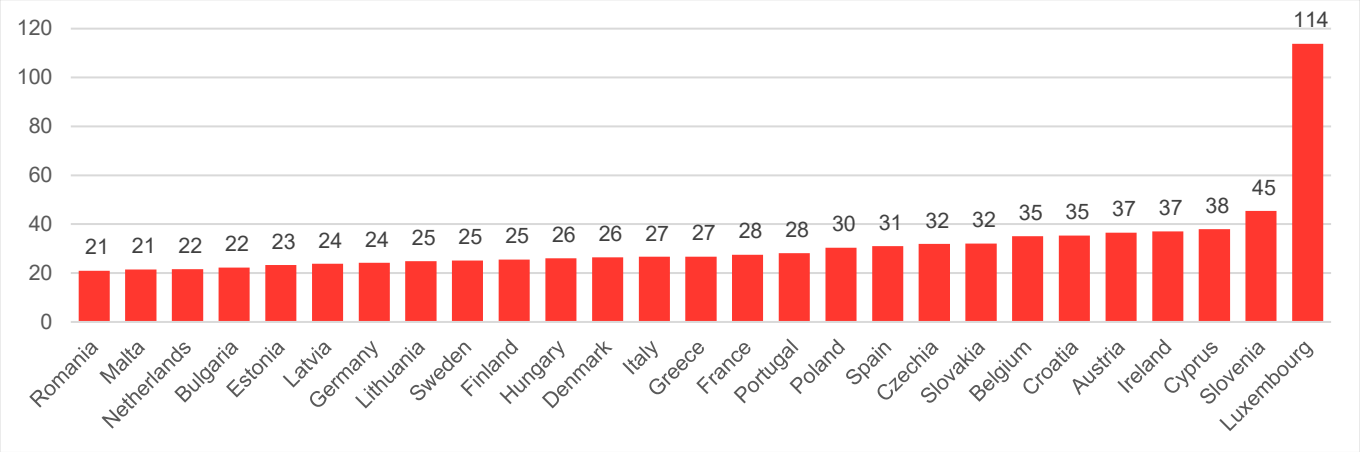
To capture this effect, the estimated ETS2 price increases are combined with data on **average household fuel consumption** in each Member State to derive an indicative **annual additional fuel expenditure per household (€ per year)** under the different price scenarios. The calculation can be expressed as follows:

$$Annual\ additional\ expenditure\ (€\ /\ household) = ETS2\ price\ increase\ (€/l) \times Fuel\ consumption\ (litres/year$$

This approach provides an **order-of-magnitude estimate** of the direct cost implications of ETS2, illustrating how a common EU-wide carbon price signal translates into different levels of additional fuel expenditure across Member States.

The figure below presents the estimated additional monthly fuel cost per household associated with ETS2 under the medium price scenario. The estimates are derived by combining the ETS2-induced increase in fuel prices (from Step 1) with data on average household fuel consumption by fuel type (gasoline and diesel – LPG is not considered in this analysis; source: Eurostat) across Member States.[12]

Figure 2-5: Estimated ETS2 cost for households (€/month, medium scenario)[13]



Source: WSP elaboration

The variation observed across Member States primarily reflects differences in **average household fuel consumption**, with higher-consumption countries showing larger absolute cost increases. These results should be interpreted alongside differences in baseline fuel prices, which shape the context in which these increases are experienced (see the Box below).

It is important to note that this analysis is based on **national averages** and therefore does not capture significant within-country variation in income, mobility patterns or access to alternatives. As such, it should be interpreted as an **illustrative indicator of the scale of the ETS2-related price shock**, rather than a measure of distributional impacts or household vulnerability.

A more granular assessment of impacts across income groups and household types is developed separately (see Task 4). The results presented here are therefore used to **contextualise the magnitude of ETS2-related cost increases** and to provide a bridge between the EU-level price signal and the subsequent multidimensional exposure analysis.

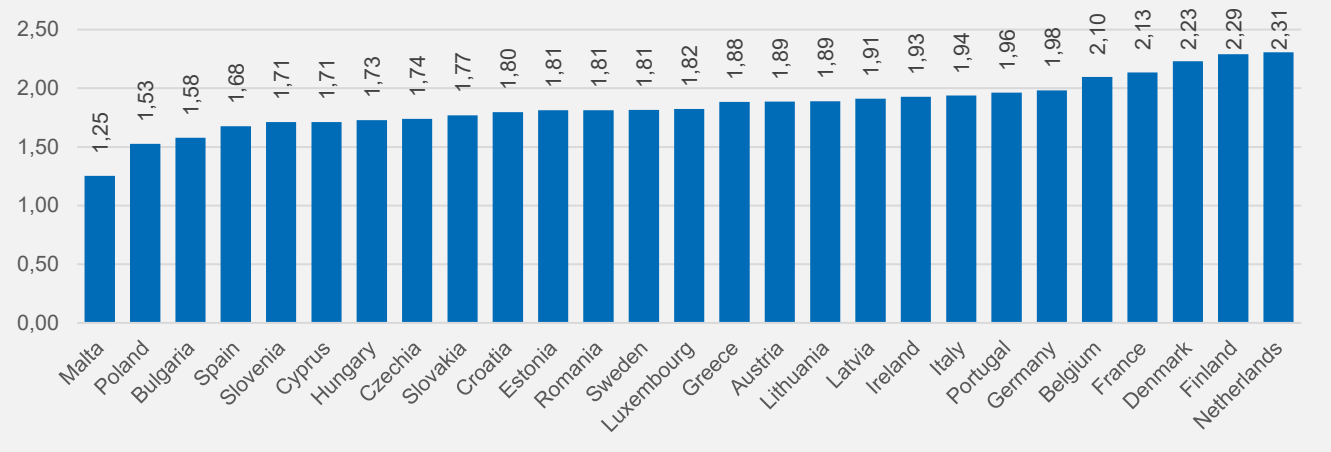
Box 2: Fuel price context across Member States

In parallel, it is important to consider the **existing level of fuel prices**, which varies significantly across the EU. Current fuel prices range from approximately **€1.25/l in lower-price Member States to over €2.30/l in higher-price countries**, with most Member States falling between €1.7 and €2.1 per litre. These differences are largely driven by national taxation regimes and market conditions.

[12] Specifically, consumption volumes, expressed in energy terms (source: Eurostat, Complete energy balances [nrg_bal_c__custom_21530502] and Private households by household composition, number of children and age of youngest child [lfst_hhnhtych__custom_21531450]), are converted into fuel-specific costs using standard emission factors for road transport fuels (source: EEA/EMEP air pollutant emission inventory guidebook) and the assumed carbon price (Step 1), allowing the calculation of an indicative €/month impact per household.

[13] Luxembourg is a clear outlier – please see footnote No. 14.

Figure 2-6: Average fuel (gasoline, diesel, LPG) price (€/l), 14 May 2026



Source: WSP elaboration on European Commission - Weekly Oil Bulletin data

While baseline price levels provide useful context for interpreting the magnitude of ETS2-related increases, they do not, in themselves, determine household exposure. In particular:

Lower fuel prices do not necessarily correspond to lower financial burden, especially in lower-income countries where fuel expenditure may already represent a significant share of household budgets;

Higher fuel prices do not automatically imply greater vulnerability, particularly where income levels are higher and households have greater capacity to absorb additional costs.

For this reason, fuel price levels are **not used directly in the composite exposure indicators** developed in the following sections. Including them would risk conflating structural exposure with policy-driven and short-term price variations, as well as double-counting effects already captured through observed expenditure shares.

Underlying exposure

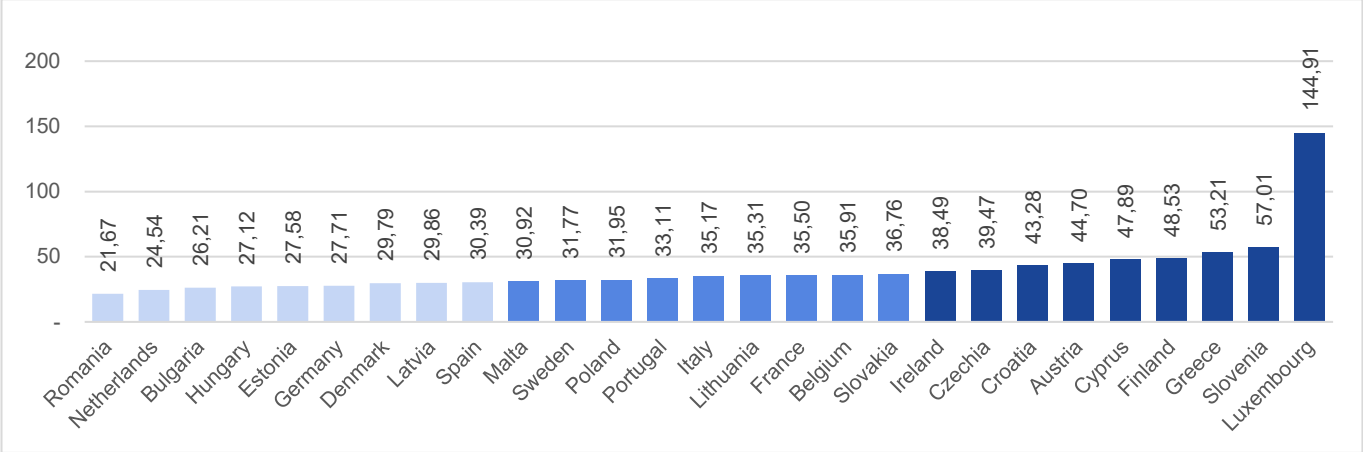
This section presents the assessment of underlying household exposure to ETS2-related fuel price increases across Member States. The analysis focuses on structural and socio-economic factors that shape the extent to which households are likely to be affected, independently of policy responses or behavioural adjustments.

The underlying exposure index focuses on three comparable indicators that proxy the main structural and socio-economic drivers of exposure across Member States: transport fuel consumption per household (structural exposure), median household income (economic resilience), and the share of household expenditure devoted to transport fuels (observed fuel burden).

Structural exposure (transport fuel consumption per household)

The chart below shows the distribution of transport fuel consumption per household across EU Member States; the three colours represent the terciles of this distribution, with each colour grouping nine countries corresponding to low, medium and high consumption levels.

Figure 2-7: Fuel consumption (GJ/household), 2023



Source: WSP elaboration on Eurostat data: Disaggregated final energy consumption in transport by mode of transport – quantities [nrg_d_traq] and Private households by household composition, number of children and age of youngest child [lfst_hhnhtych]

The distribution of transport fuel consumption per household shows substantial variation across Member States, ranging from around 22 GJ per household in Romania to 57 GJ per household in Slovenia (and around 145 GJ per household in Luxembourg, which is a clear outlier[14]). Most countries cluster between roughly 25 and 50 GJ, with a gradual increase across the distribution.

A group of Member States – including Austria, Cyprus, Finland, Greece and Slovenia – exhibit comparatively high consumption levels (above ~45 GJ), indicating stronger structural reliance on private vehicle use and/or higher transport energy demand per household. By contrast, countries such as Romania, the Netherlands, and Hungary lie at the lower end of the distribution, suggesting lower average fuel use per household.

Economic resilience (median household income)

Median household income (in PPP terms) varies significantly across Member States, with a clear gradient between higher- and lower-income countries.

At the upper end, Luxembourg (€37,673) is followed by Austria, the Netherlands, Belgium and Germany, all above €25,000. These countries exhibit the highest levels of economic resilience in the dataset.

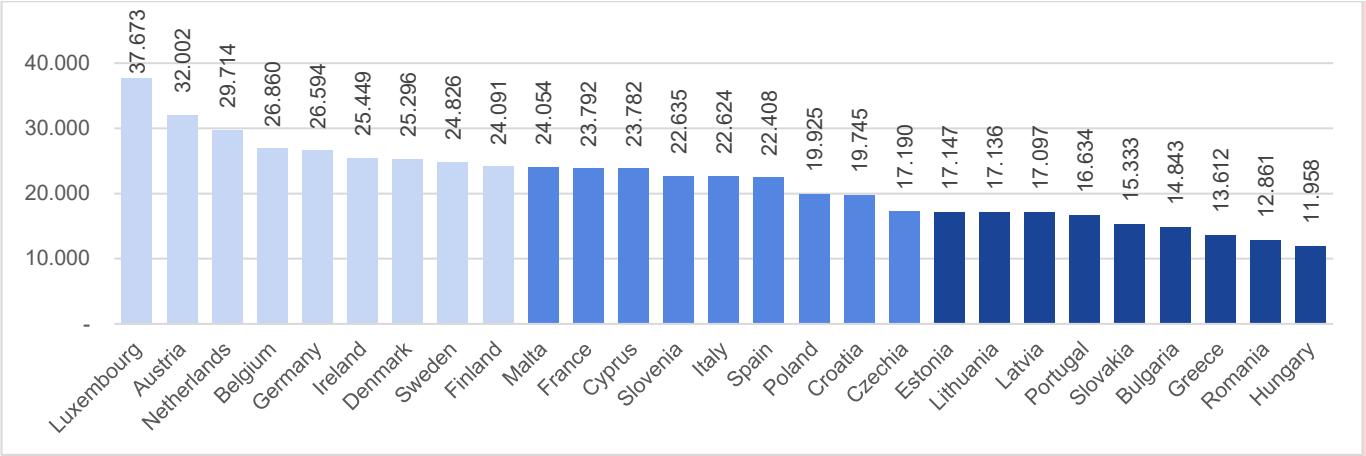
At the lower end, Hungary (€11,958), Romania (€12,861), and Greece (€13,612) show substantially lower income levels, indicating more limited capacity to absorb increases in fuel costs.

A large group of Member States sits in the intermediate range (approximately €17,000–€24,000), including France, Italy, Spain, Slovenia and Czechia, indicating moderate resilience.

The distribution is relatively smooth, with no abrupt breaks, but the gap between the lowest- and highest-income Member States is substantial. This implies that the same increase in fuel prices may translate into significantly different affordability impacts across countries, even before considering differences in consumption.

[14] Luxembourg is a clear and extreme outlier, with consumption more than three times higher than any other Member State in the dataset. This cannot be interpreted as reflecting household behaviour alone. A large body of evidence shows that fuel sales in Luxembourg are heavily influenced by cross-border "fuel tourism" and transit refuelling, driven by systematically lower fuel prices due to lower taxation. As a result, the very high consumption observed for Luxembourg largely reflects fuel sales to non-residents rather than domestic household demand and should be interpreted with caution in the context of household exposure.

Figure 2-8: Median income (PPP), 2025



Source: WSP elaboration on Eurostat data: Mean and median income by age and sex [ilc_di03__custom_21534236]

Observed fuel burden (household expenditure on transport fuels as a share of total household expenditure)

The share of household expenditure devoted to transport fuels varies from 1.8% (Luxembourg) to 6.7% (Slovenia), indicating large differences in how fuel costs affect household budgets.

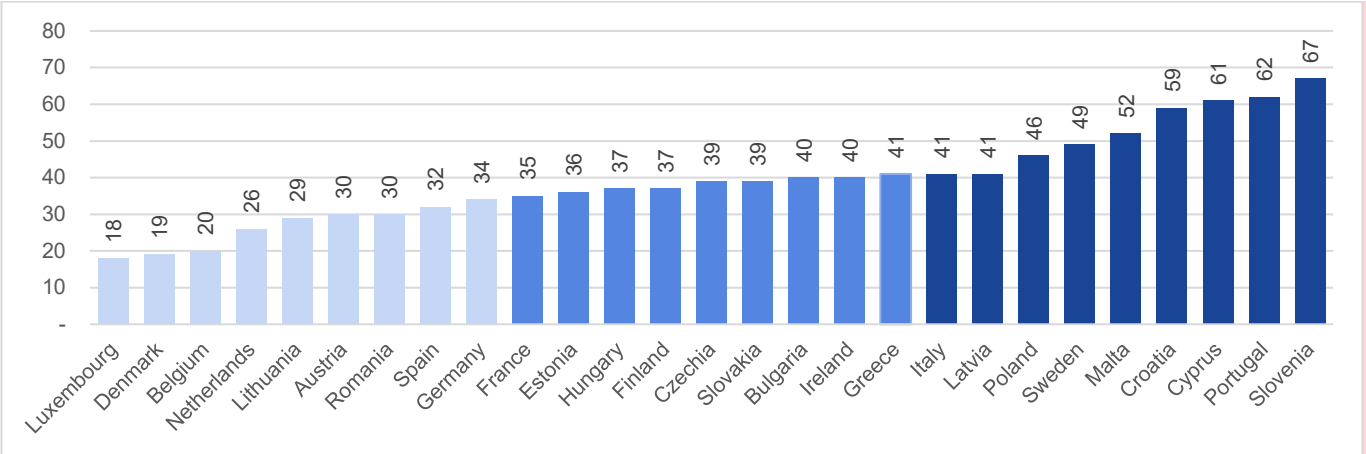
Countries with the lowest shares include Luxembourg, Denmark and Belgium, where fuel expenditure represents a relatively small proportion of overall consumption. At the other extreme, Slovenia, Portugal, Cyprus and Croatia show significantly higher shares, suggesting a stronger financial burden.

A notable feature of the distribution is that several countries with mid-range consumption still exhibit high expenditure shares, indicating that fuel costs already represent a significant constraint on household budgets in these cases.

Conversely, some higher-income countries (e.g. Luxembourg, Denmark) combine relatively low expenditure shares with moderate or high consumption, reflecting stronger purchasing power.

Overall, the chart highlights that current fuel expenditure already varies markedly across Member States, providing a direct indication of where households may be more exposed to additional price increases.

Figure 2-9: Expenditure in CP0722 "Fuels and lubricants for personal transport equipment" (per mille), 2020



Source: WSP elaboration on Eurostat data: Structure of consumption expenditure by COICOP consumption purpose [hbs_str_t211__custom_21327923]

Underlying exposure index

The underlying exposure index combines three dimensions – structural exposure, economic resilience and observed fuel burden – into a composite measure ranging from 3 (lowest exposure) to 9 (highest exposure).

It should be noted that this is a **relative index**, designed to compare Member States with one another rather than to measure absolute levels of exposure. The index is based on the relative position of each Member State in the distribution of indicators, including household fuel consumption, purchasing power, and fuel expenditure shares. As

a result, the categorisation should not be interpreted as indicating whether a country will or will not be affected by ETS2. All Member States are expected to experience some degree of impact from ETS2. Rather, the index identifies which countries are likely to face relatively higher or lower levels of exposure compared with other Member States. Consequently, countries classified in the lowest exposure group are not unaffected by ETS2, nor are they expected to benefit from it; instead, they are considered to be comparatively less exposed than countries in the medium- and high-exposure groups. The index should therefore be interpreted as a measure of relative vulnerability and ranking, rather than as an assessment of the absolute magnitude of ETS2 impacts.

Each dimension is first normalised by assigning Member States to terciles of the distribution. Countries in the lowest tercile are assigned a score of 1, those in the middle tercile a score of 2, and those in the highest tercile a score of 3, with higher scores reflecting greater contribution to overall exposure (i.e. higher consumption, lower income, or higher expenditure shares). The three scores are then aggregated to produce the overall index.[15]

The complete results of the underlying exposure index, including the scores for each dimension and the overall index value, are presented in Appendix 7.2.

Based on this approach, three broad groups emerge:

- **Low exposure (index ≈ 3–4):** Countries such as **Germany, Spain, Luxembourg, the Netherlands, Denmark, and Finland** combine favourable conditions across all three dimensions, with relatively low or moderate fuel consumption, higher income levels and lower fuel expenditure shares.
- **Medium exposure (index ≈ 5–6):** Countries including **France, Austria, Ireland and Lithuania** display more mixed profiles, typically combining moderate structural exposure with intermediate income levels or relatively higher expenditure shares.
- **High exposure (index ≈ 7–9):** Countries such as **Greece, Croatia, Cyprus, Portugal, and Slovenia** consistently score unfavourably across multiple dimensions, reflecting a combination of lower income levels, higher expenditure shares and/or greater structural reliance on transport fuels.

While the three dimensions capture distinct aspects of exposure, there is partial overlap in their explanatory power. For example, the fuel expenditure share is influenced by both income and consumption levels, and therefore reflects, to some extent, the combined effect of the other two indicators. However, it is retained as a separate dimension because it captures observed outcomes at the household level, providing an empirical measure of how fuel costs actually materialise within household budgets. Similarly, structural exposure and income capture different but complementary aspects of vulnerability: the former reflects dependence on fossil fuels, while the latter captures the capacity to absorb price increases.

Adjusted exposure

This section extends the analysis of underlying exposure by incorporating additional dimensions that influence how ETS2-related fuel price increases are likely to translate into effective impacts across Member States. While the underlying exposure index captures structural dependence on fossil fuels and households' economic capacity to absorb higher costs, it does not fully reflect the extent to which households can adapt to rising carbon prices or the policy context within which ETS2 is implemented.

To address this, two complementary factors are considered: transition capacity, which reflects the ability of households and vehicle fleets to shift away from fossil fuel dependence over time, and the existing carbon pricing and fuel taxation framework, which determines whether ETS2 introduces a new price signal or reinforces an already established one. Together, these dimensions are used to derive an adjusted exposure index, providing a more comprehensive and policy-relevant assessment of Member State exposure to ETS2.

Transition capacity (share of EVs in passenger car fleet)

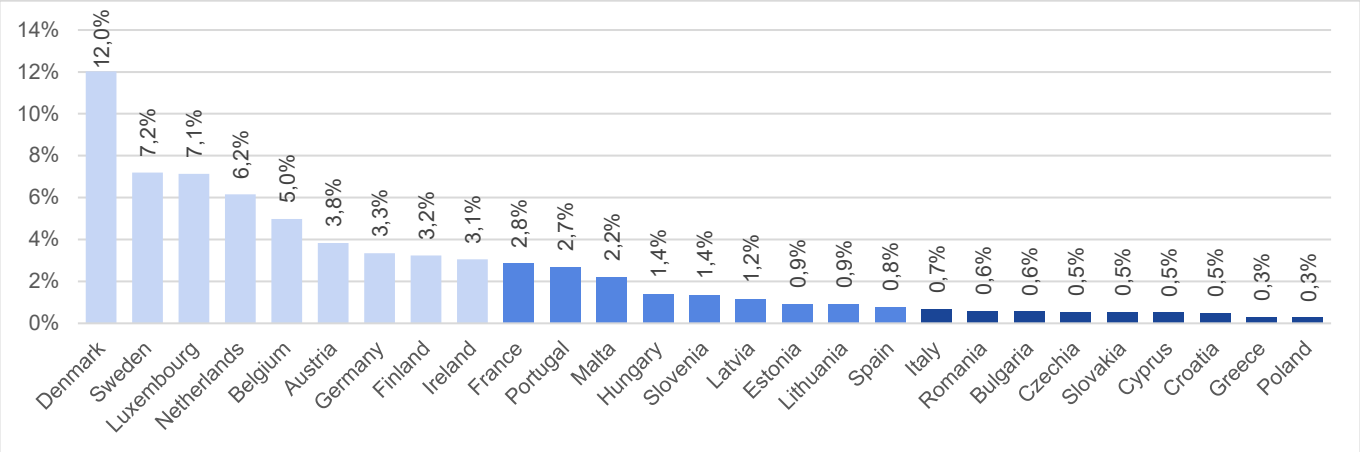
Transition capacity plays a central role in shaping the extent to which households are exposed to ETS2 over time. It reflects the degree to which national vehicle fleets have already begun to decarbonise, proxied by the share of electric vehicles (EVs) in the passenger car fleet. Higher EV penetration reduces reliance on fossil fuels for mobility and therefore limits direct exposure to carbon pricing on petrol and diesel. Conversely, low EV uptake indicates stronger structural dependence on internal combustion engine vehicles and a greater persistence of exposure to ETS2-related fuel price increases.

[15] An exception is made for Luxembourg in the structural exposure dimension. While the raw data would place Luxembourg in the highest tercile (score = 3), it is assigned a score of 2 to account for its role as a statistical outlier driven by cross-border fuel sales rather than representative household consumption. This adjustment ensures that the index better reflects underlying household exposure rather than distortions linked to fuel tourism.

Significant variation is observed across Member States. Countries such as Denmark, Sweden, Luxembourg and the Netherlands show relatively high EV shares, indicating stronger transition capacity and a more advanced shift towards low-emission mobility. By contrast, several Central and Eastern European and Mediterranean countries exhibit much lower EV penetration, reflecting a combination of factors including lower income levels, limited charging infrastructure and slower uptake of new vehicle technologies.

These differences imply that the impact of ETS2 will not only depend on current fuel consumption levels, but also on the pace at which households can transition to alternative technologies. In Member States with higher EV shares, a larger proportion of households is already insulated from future fuel price increases, while in those with low electrification levels, exposure is likely to remain more persistent unless supported by targeted policy measures.

Figure 2-10: Share of zero-emission vehicles in passenger car fleet, 2024



Source: WSP elaboration on Eurostat data: Stock of zero-emission vehicles at 31st December by type of vehicle and type of motor energy [road_eqs_zev__custom_21531980]

Existing carbon pricing schemes

Overall, the diversity of national frameworks is likely to result in uneven adjustment costs and heterogeneous impacts across Member States, not only in terms of price levels but also with regard to policy continuity and the perceived fairness and acceptability of ETS2.

Existing carbon pricing arrangements vary considerably across the EU. Several Member States already operate explicit carbon pricing instruments for sectors targeted by ETS2, including national emissions trading systems (e.g. Austria and Germany) and carbon taxes (e.g. Denmark, Finland, France, Ireland, Luxembourg, Poland, Slovenia and Sweden). These instruments differ in their scope, level of carbon pricing, coverage of buildings and transport emissions, and degree of alignment with existing energy taxation systems. As a result, households and businesses in some Member States already face carbon price signals similar to those expected under ETS2, whereas others may experience a more pronounced policy change. This heterogeneity is likely to influence both the distributional impacts of ETS2 and its political and social acceptability across Member States.

A summary of existing carbon pricing and fuel taxation frameworks in Member States is provided in Appendix 7.2.

Adjusted exposure index

The adjusted exposure index combines the underlying exposure index with transition capacity and the existing carbon pricing and taxation framework to provide a more comprehensive assessment of Member State exposure to ETS2. This approach reflects the idea that exposure is not determined solely by current dependence on fossil fuels and economic vulnerability, but also by the ability to adapt and the policy environment within which carbon pricing is introduced.

The three indicators are scored as following:

- To ensure consistency across dimensions, the underlying exposure index, originally expressed on a scale from 3 (lowest exposure) to 9 (highest exposure), is rescaled to a simplified 1–3 score, where higher values indicate greater exposure.
- Transition capacity is similarly scored using the same tercile-based approach as for the underlying exposure indicators, with Member States grouped into three equal-sized categories based on their share of EVs in the passenger car fleet and assigned scores from 1 to 3 accordingly.

- For the existing carbon pricing and fuel taxation framework, a binary scoring approach is adopted: Member States with an established carbon pricing mechanism for transport fuels are assigned a score of 1, while those without such mechanisms are assigned a score of 3, reflecting a higher expected incremental impact from the introduction of ETS2.

By incorporating these additional dimensions, the adjusted index highlights how some Member States may experience higher or lower effective exposure than suggested by the baseline indicators alone. For example, countries with relatively high underlying exposure but stronger transition capacity or established carbon pricing mechanisms may move towards a lower adjusted exposure classification. Conversely, Member States with moderate baseline exposure but low electrification and limited prior carbon pricing may face higher effective exposure once ETS2 is implemented.

The results are summarised in the table below, which groups Member States into low, medium and high exposure categories based on the adjusted exposure index. Compared to the underlying exposure results, some countries shift categories, reflecting differences in transition readiness and policy context. In general, Member States with higher levels of electrification and established carbon pricing frameworks tend to be less exposed, while those combining stronger dependence on fossil fuels, more limited transition capacity and less developed pricing frameworks remain more exposed.

Table 2-3: Adjusted exposure: Member State grouping

Relatively lower exposure		Moderate relative exposure			Relatively higher exposure	
= Already in "Low exposure" group in the underlying exposure assessment	← From "Mid exposure" group in the underlying exposure assessment	→ From "Low exposure" group in the underlying exposure assessment	= Already in "Mid exposure" group in the underlying exposure assessment	← From "High exposure" group in the underlying exposure assessment	→ From "Mid exposure" group in the underlying exposure assessment	= Already in "High exposure" group in the underlying exposure assessment
Denmark Germany Luxembourg	Ireland Austria Sweden Finland	Belgium Netherlands Spain	Estonia France Latvia Lithuania Hungary Malta Poland	Slovenia	Bulgaria Czechia Italy Romania Slovakia	Greece Croatia Cyprus Portugal

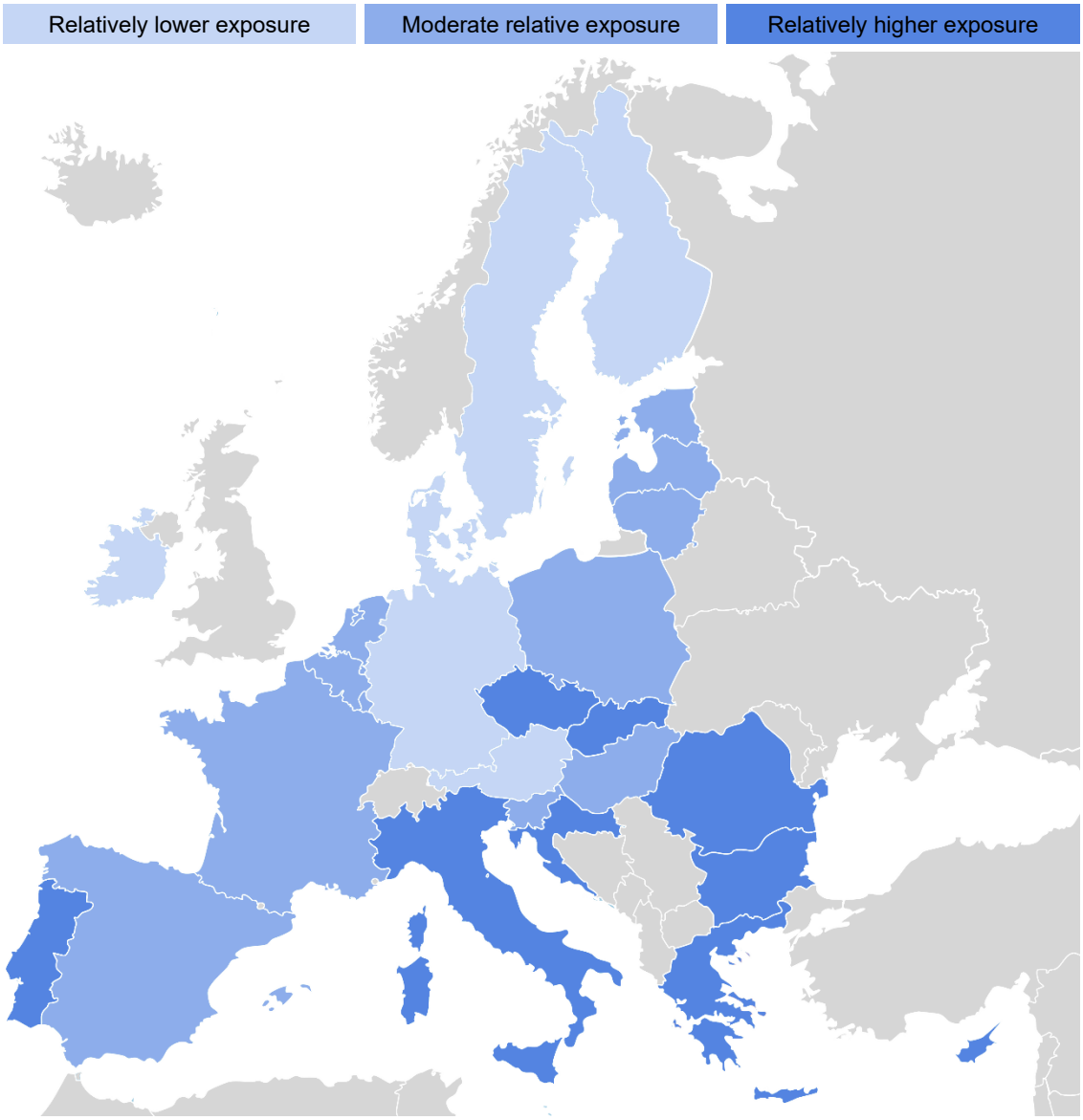
Figure 2-11 provides a visual representation of these results and reveals a clear geographic pattern in exposure across the EU. A broad gradient can be observed, with lower exposure concentrated in Northern and Western Member States (including Denmark, Sweden, Finland, Germany, and the Netherlands), and higher exposure more prevalent in Southern and Eastern Member States (including Greece, Portugal, Croatia, Cyprus, and parts of Central and Eastern Europe).

This pattern reflects underlying structural differences captured in the index. Northern and Western countries tend to combine higher income levels, more advanced electrification of transport, and more developed carbon pricing frameworks, which together reduce their effective exposure. By contrast, many Southern and Eastern Member States exhibit lower average income levels, higher observed fuel expenditure shares, lower EV penetration, and more limited prior carbon pricing, resulting in higher adjusted exposure.

Central and Eastern Member States in particular tend to cluster in the medium-to-high exposure range, reflecting a combination of moderate structural dependence on fossil fuels and comparatively limited transition capacity. Southern Member States, while more heterogeneous, include several of the highest-exposure countries, driven by a combination of high fuel expenditure burdens and lower economic resilience.

Overall, the figure highlights that exposure to ETS2 is not randomly distributed across the EU but follows a recognisable macro-regional pattern, broadly aligned with differences in income levels, energy systems, and transport structure. This reinforces the importance of considering regional context when designing mitigation and support measures.

Figure 2-11: Adjusted exposure: Member State grouping



This classification provides an important analytical bridge to Step 3. By identifying where exposure is structurally higher or lower, it helps contextualise the distributional and consumer-level impacts of ETS2 across income groups, regions and mobility profiles. In particular, it highlights that the effects of ETS2 cannot be assessed solely on the basis of average fuel price increases, but must also consider how these increases interact with existing vulnerabilities and the capacity of households to adapt.

2.2.3 Step 3: Distributional and consumer-level impact assessment

Building on the ETS2 price scenarios, implementation timeline and retail fuel-price impacts identified in Step 1, this step assesses how ETS2-related increases in petrol and diesel prices may affect different consumer groups, territories and Member States. The focus is on road transport exposure, rather than wider household energy impacts.

The reviewed evidence shows that ETS2 transport impacts are likely to differ substantially across households, regions and mobility profiles. This is because households do not consume the same amount of road fuel, do not have the same income levels, and do not have equal access to alternatives such as public transport, electric vehicles, charging infrastructure or more efficient vehicles. As a result, the same increase in petrol or diesel prices can translate into very different affordability impacts depending on income, car dependence, location, vehicle type and access to low-carbon mobility options.

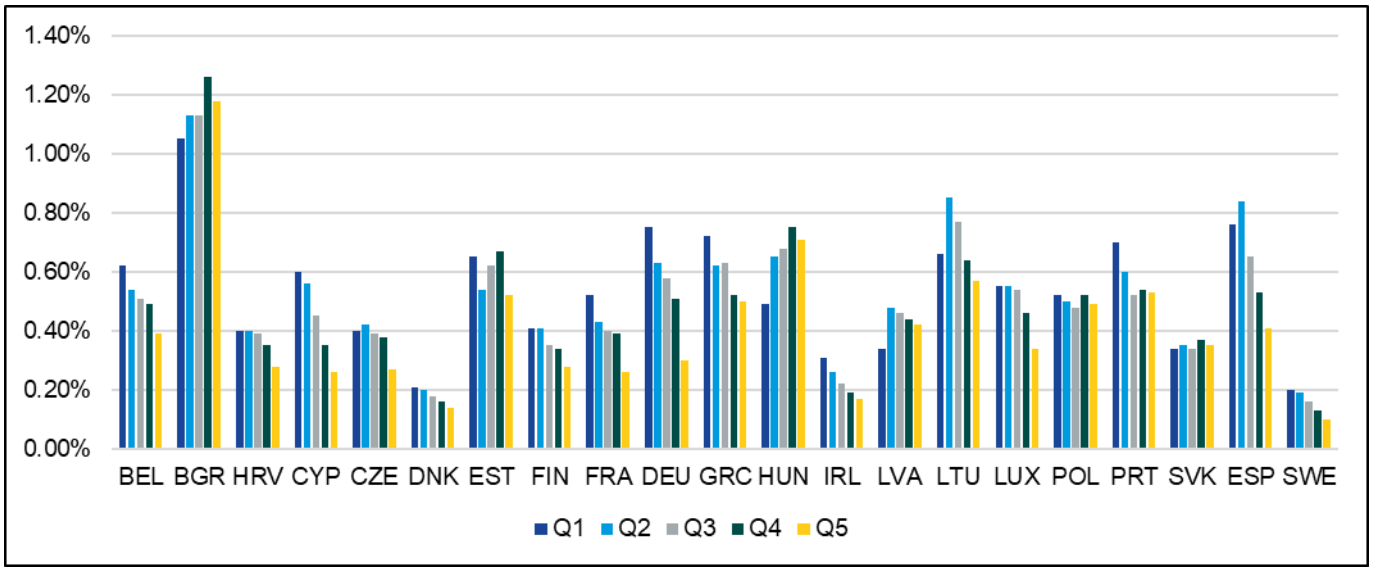
The evidence base is heterogeneous. Some sources provide quantitative modelling of transport exposure by income group, region or household type, while others provide qualitative evidence on transport poverty, revenue recycling, EV adoption or policy design. A more detailed mapping is provided in Annex 7.1. The main text below synthesises the recurring findings across four dimensions: income groups, regional impacts, territorial differences and mobility profiles.

Impacts across income groups

Transport poverty is defined by the European Commission as individuals' and households' inability or difficulty to meet the costs of private or public transport, or their lack of, or limited access to, the transport needed to reach essential socio-economic services and activities, taking into account the national and spatial context. This definition highlights that transport poverty extends beyond exposure to petrol and diesel prices, encompassing wider issues of transport affordability, availability and accessibility (European Commission, 2025)

ETS2 road transport impacts are therefore not uniformly regressive across all income groups. Exposure to higher petrol and diesel prices depends on whether households own and use fossil-fuel vehicles; as a result, the lowest-income households may face lower direct fuel exposure where car ownership is limited, while lower-middle and middle-income households can face material proportional costs when private car use is required for commuting, access to services or family mobility (Elsevier, 2026).

Figure 2-12. Increase in transport expenditure as a share of disposable income, by income quintile and country, under a €100/tCO$_2$ ETS2 price assumption



Source: WSP elaboration on Perdana and Vielle's data (Elsevier, 2026)

Note: Values show the estimated increase in transport expenditure as a percentage of disposable income for each income quintile. The figure covers the 21 countries available in the data from the source. Austria, the Netherlands, Italy, Romania, Slovenia and Malta are not included because of missing or incomplete household database coverage.

Figure 2-12 shows substantial variation across countries, but the broad pattern is that the highest-income quintile generally faces a lower proportional burden than lower and middle-income quintiles. To make this pattern easier to interpret, an indicative unweighted average across the 21 countries shown suggests a transport burden of approximately **0.53% of disposable income for Q1, 0.53% for Q2, 0.50% for Q3, 0.48% for Q4 and 0.39% for Q5**. This should be interpreted as an illustrative cross-country average, not as a household-weighted EU average (Elsevier, 2026).

The resulting profile is moderately regressive, but not linear. Lower-income households have less disposable income, which increases the relative burden of any fuel-price increase; **however, the poorest households are also less likely to own a private vehicle, which can reduce direct exposure to petrol and diesel costs**. As a result, Q2 and Q3 households may face similar or only slightly lower proportional impacts than Q1 where constrained income overlaps with fossil-car dependence (Elsevier, 2026).

The relevant vulnerability group is therefore not defined by income alone, but by the interaction between income constraints, mobility needs and access to affordable alternatives. Evidence from the Netherlands illustrates this distinction. CE Delft identifies around 1.14 million households with income up to 130% of the social minimum as the broader proxy group in a vulnerable position for transport poverty (CE Delft, 2025). Within this group, 422,000

currently own a fossil-fuel car and are directly exposed to higher petrol and diesel prices, while 411,000 are financially carless, meaning that they do not own a car because they cannot afford one. By 2030, these groups are estimated at around 403,000 low-income fossil-car households and 466,000 financially carless households[16]. This distinction is important: direct ETS2 fuel-cost exposure for low-income fossil-car users, and broader mobility-affordability constraints for financially carless households, for whom higher vehicle running costs may place car access even further out of reach.

The ability to avoid ETS2-related transport costs is also income-dependent. Reducing exposure often requires upfront investment in a cleaner vehicle, access to affordable charging, or the ability to shift to alternative modes; these options are less accessible to lower-income households. Among low-income car owners, only 17% intend to purchase a partly or fully electric next car, compared with 51% among households with income above twice modal income, confirming a clear transition capacity gap (CE Delft, 2025).

This diagnosis has a direct implication for revenue use: evidence on the distribution of the overall ETS2 household burden suggests that **circulating back 50% of revenues to lower-income households would be sufficient to fully compensate the burden of the lower 60% of households** (T&E, 2025). This will be discussed more in detail in Subtask 1.2.

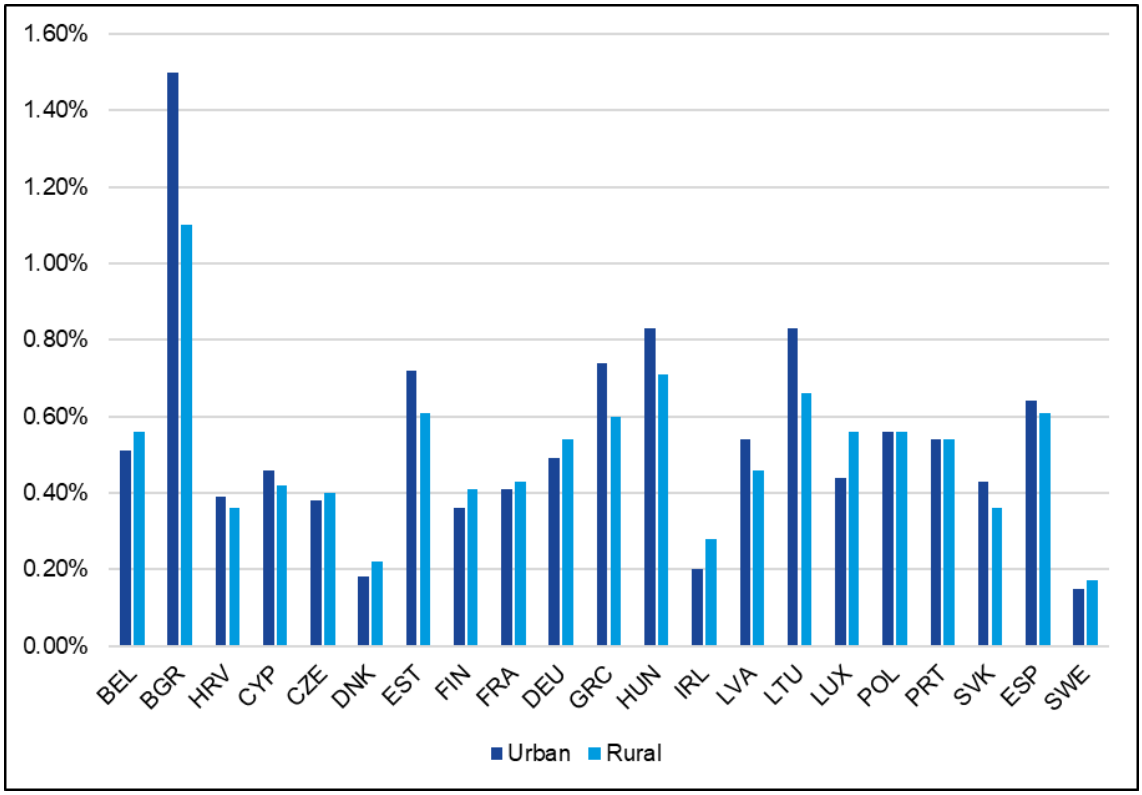
Territorial differences: urban, suburban and rural areas

Territorial conditions shape ETS2 transport exposure, but the evidence does not support a simple rural-versus-urban hierarchy. Less dense, peripheral and rural areas can face higher structural exposure because travel distances tend to be longer and public transport coverage is often weaker, while urban and peri-urban areas can also remain exposed where commuting patterns or settlement structures sustain high car use. The implication is that ETS2 support should not rely on a simple rural-versus-urban classification, but on granular territorial targeting that reflects local travel distances, public transport access and settlement patterns (Bruegel, 2025) (Elsevier, 2026).

For consistency and cross-country comparability, this section applies the definition used by (Elsevier, 2026): urban households are those living in areas with at least 500 inhabitants per km², while households outside this threshold are classified as rural (Elsevier, 2026). On this basis, Figure 2-13 presents the estimated impact of a €100/tCO_2 ETS2 price on transport expenditure as a share of disposable income for urban and rural households across the 21 countries covered in the WILIAM household database.

[16] The residual group mainly comprises around 263,000 carless households that are not classified as financially carless, plus around 45,000 “other” households with an electric or lease car.

Figure 2-13. Urban-rural differences in transport expenditure impacts under a €100/tCO$_2$ ETS2 price assumption



Source: WSP elaboration on Perdana and Vielle's data (Elsevier, 2026)

Note: Values show the estimated increase in transport expenditure as a percentage of disposable income for urban and rural households. Urban households are defined as those living in areas with at least 500 inhabitants per km²; other households are classified as rural. The figure covers the 21 countries available in the data from the source.

Figure 2-13 shows that urban-rural impacts are highly country-specific. The unweighted average across the 21 countries is broadly similar for urban and rural households, at approximately **0.54% and 0.50%** of disposable income respectively. Rural households face higher proportional impacts in some Member States, but rural impacts are lower than urban impacts in **9 of the 21 countries** shown. This indicates that harmonised household-expenditure modelling does not show a uniform rural premium (Elsevier, 2026).

This finding does not make territorial vulnerability irrelevant; it shows that its direction and scale vary by country. Around 70% of national transport emissions originate outside major cities, which explains why rural and peripheral areas can be more exposed where longer distances and weaker public transport increase reliance on private vehicles. At the same time, urban areas remain substantially car-based in many European cities, meaning that urban location does not automatically eliminate exposure (Bruegel, 2025)

The evidence is therefore complementary rather than contradictory. Rural and peripheral exposure is a real mechanism, but it does not translate into a systematically higher rural burden in every Member State. The policy implication is that spatial vulnerability should be assessed through territorial context and regional patterns, rather than through a blanket assumption that rural households are always more affected (Bruegel, 2025) (Elsevier, 2026).

National evidence confirms the need for sub-national targeting. In the Netherlands, increased ETS2 transport risk is present across all degrees of urbanisation, but less urbanised and rural areas show higher exposure because distances to services are longer and public transport access is weaker. In 2030, households with increased ETS2 risk are distributed across all urbanisation categories: **29% very strongly urban, 31% strongly urban, 11% moderately urban, 19% weakly urban and 9% non-urban**[17]. These figures should not be interpreted as a uniform distribution across urbanisation categories: they show where households with increased ETS2 risk are located in absolute terms, not the risk rate within each type of area. In other words, urban areas contain the largest absolute

[17] The degree of urbanisation follows the CBS classification applied in the source, based on surrounding address density ("omgevingsadressendichtheid", OAD). OAD measures the number of registered address points within a 1 km radius around an address, divided by the area of that circle, and is used as a proxy for the concentration of human activities such as living, working, education, shopping and leisure. The categories are: very strongly urban: ≥2,500 addresses/km²; strongly urban: 1,500–<2,500 addresses/km²; moderately urban: 1,000–<1,500 addresses/km²; weakly urban: 500–<1,000 addresses/km²; and non-urban: <500 addresses/km².

number of affected households, while less urbanised and rural areas may still face higher relative exposure due to longer distances to services, weaker public transport access and greater car dependency (CE Delft, 2025).

Overall, the territorial evidence shows that ETS2 transport impacts are spatially differentiated, but not spatially deterministic. Location matters because it shapes travel distances, access to alternatives and dependence on private vehicles; however, the same territorial category can contain very different exposure profiles. This means that territorial targeting should be used to identify where vulnerability is more likely to emerge, but not as a standalone proxy for who is most affected. The next section therefore shifts the analysis from territorial exposure to household mobility profiles, examining which transport users are most exposed within and across these territories.

Mobility profiles and exposed transport users

ETS2 transport exposure depends not only on income or location, but also on how households meet their mobility needs. The highest-risk profiles are households that combine fossil-fuel vehicle dependence, high travel needs, limited access to alternatives and limited financial capacity to switch technologies or modes (CE Delft, 2025) (EIONET, 2026).

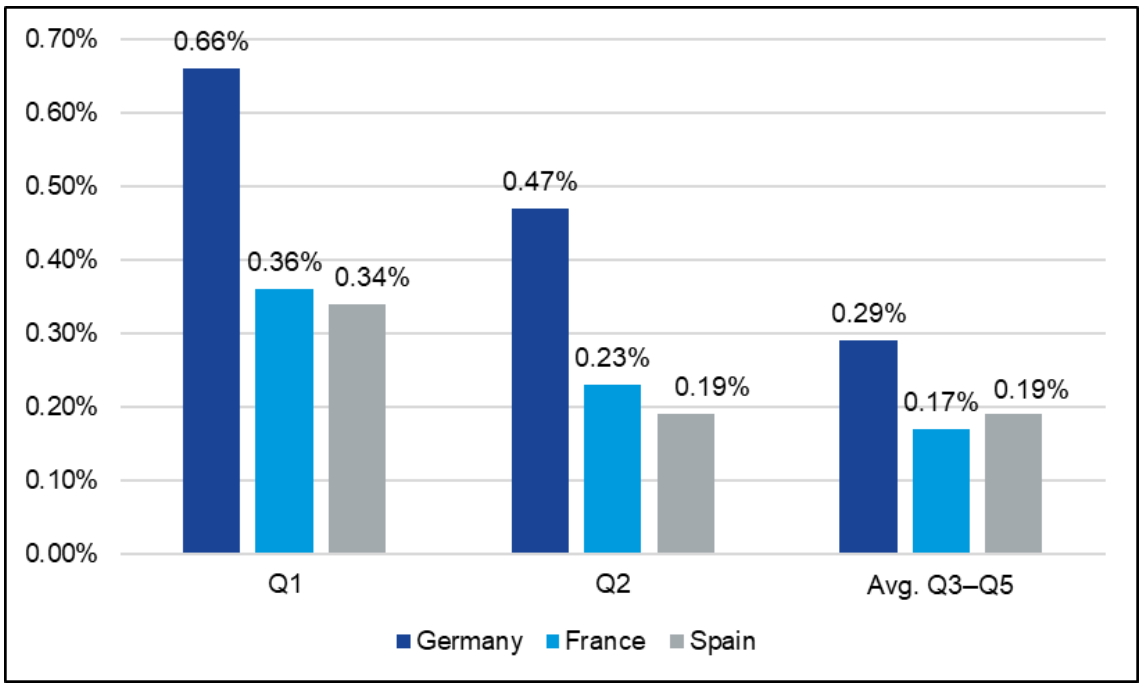
The most directly exposed group is **low-income households that rely on fossil-fuel cars and have limited mobility alternatives**. In the Netherlands, 111,000–247,000 households with income below 130% of the social minimum are estimated to have a fossil-fuel car and limited mobility provision in 2030. Limited mobility provision is identified through low public transport accessibility, above-average distance to services and/or above-average fuel costs, meaning these households are exposed both to higher fuel prices and to weak alternatives (CE Delft, 2025).

Households relying on older or less efficient internal combustion vehicles are also exposed, because lower-income car owners may be more likely to depend on second-hand vehicles with higher fuel consumption. This creates a double vulnerability: these households face higher running costs from ETS2 while also having less capacity to replace their vehicle with a zero-emission alternative (European Commission, 2021) (EIONET, 2026).

Carless households should not be treated as automatically unaffected. Households without a car and without a need or wish for car ownership face limited direct exposure to petrol and diesel price increases, but **financially carless households** face a different vulnerability: restricted access to mobility because they cannot afford a car despite needing one. This distinction matters because transport poverty includes both households paying more for fossil-fuel mobility and households whose mobility options are already constrained by affordability (CE Delft, 2025).

Public-transport-dependent users represent a distinct mobility profile, because their ETS2 exposure is mainly indirect and mediated through fare affordability rather than direct fuel purchases. Figure 2-14 compares bus transport expenditure as a share of total household expenditure across income groups in Germany, France and Spain.

Figure 2-14. Expenditure on bus transport as a share of total household expenditure, by income group



Source: WSP elaboration on Bruegel's data (Bruegel, 2025).

Note: The figure compares the first- and second-income quintiles with the average of the third, fourth- and fifth-income quintiles. The data refer to public transport by road only and do not cover trains, trams or other public transport modes.

Figure 2-14 shows that, in Germany, France and Spain, the lowest income quintile spends a higher share of total household expenditure on bus transport than higher-income groups. In Germany, bus expenditure falls from around 0.66% of total expenditure for Q1 to around 0.29% for the average of Q3–Q5; in France, from around 0.36% to 0.17%; and in Spain, from around 0.34% to 0.19%. This highlights the importance of affordable public transport for low-income mobility.

However, the figure should not be interpreted as direct ETS2 fuel-price exposure, since the data reflect expenditure shares rather than actual fuel use. Moreover, as bus fleets are increasingly electrified, the link between fuel costs and fares is likely to weaken over time: zero-emission buses represented around 49% of new EU city bus registrations in 2024, rising to around 60% in 2025; among major markets in 2025, the zero-emission share of new city buses was around 50% in Germany, 42% in France and 56% in Spain (European Commission, 2025).

Overall, the key implication is that maintaining affordable public transport is essential for protecting low-income households' mobility.

The ability to reduce exposure through electrification is unevenly distributed. **Among low-income car owners, only 17% intend to purchase a partly or fully electric next car, compared with 51% among households with income above twice modal income**. This confirms a clear transition capacity gap: lower-income households are less able to respond to higher fuel prices by switching to cleaner vehicles (CE Delft, 2025).

Charging access can further widen this gap. The benefits of EV ownership depend not only on vehicle purchase costs, but also on whether households can access affordable charging. Households without home charging, private parking or low-cost electricity may face weaker financial benefits from electrification than households able to charge at home, meaning that EV-related savings may be unevenly distributed across housing and mobility profiles (ECCO, 2025).

By contrast, EV-owning households and households without a car and without a wish for car ownership are expected to experience minimal direct ETS2 transport impacts, because they are less exposed to petrol and diesel price increases. However, as noted above, these lower-exposure groups should not be confused with all carless households, since financially carless households may remain transport-poor even without direct fuel-price exposure (CE Delft, 2025).

The policy implication is that ETS2 support should be targeted by mobility profile, and not only by income group or territory. The priority groups are households whose mobility needs are difficult to reduce and whose alternatives are limited: low-income fossil-car-dependent users, households relying on older or inefficient ICE (internal combustion engine) vehicles, financially carless households, public-transport-dependent users facing weak or costly services, and households unable to access affordable electrification. Support should therefore combine short-term affordability protection with structural measures that reduce fossil-fuel dependence, including affordable EV leasing, targeted charging access, public transport improvements and shared or on-demand mobility (CE Delft, 2025) (T&E, 2025) (European Commission, 2025) (EIONET, 2026).

2.2.4 Summary

Subtask 1.1 provides a structured assessment of how ETS2 is expected to affect fuel prices and how these impacts translate into differentiated effects across Member States and consumer groups. The analysis brings together evidence from modelling studies, cross-country indicators and distributional assessments to build a consistent picture of exposure to ETS2.

The starting point (Step 1) is the identification of a range of plausible ETS2 carbon price scenarios and their translation into retail fuel price impacts. The evidence shows a relatively consistent relationship between carbon prices and fuel costs, with ETS2 likely to lead to material increases in petrol and diesel prices, particularly under medium and high scenarios. These increases are broadly uniform across the EU in per-litre terms, reflecting the common carbon price signal.

However, Step 2 shows that the same price increase does not translate into the same impact across Member States. Differences in fuel consumption, income levels and existing fuel expenditure mean that the financial burden varies significantly across countries. More importantly, exposure is shaped by a combination of structural and policy factors, including car dependence, economic resilience, fuel cost burdens, electrification levels and existing carbon pricing frameworks. This results in a clear geographic pattern, with lower exposure in higher-income and more electrified Northern and Western Member States, and higher exposure in several Southern and Eastern countries where households face tighter budget constraints and more limited transition capacity.

Building on this, Step 3 shows that within-country impacts are equally heterogeneous. ETS2 impacts are not uniformly regressive: while higher fuel prices tend to weigh more heavily on lower-income households in proportional terms, direct exposure depends on car ownership and usage. As a result, the most affected groups are often lower-middle and middle-income households that rely on cars but have limited capacity to absorb cost increases or switch to alternatives.

More broadly, vulnerability emerges from the interaction of three factors: income constraints, dependence on fossil-fuel mobility, and limited access to alternatives. This highlights that exposure is not only an income issue, but also a function of territorial context (e.g. access to services and public transport) and mobility profiles (e.g. vehicle type, travel needs, and charging access). Public-transport-dependent and carless households, while less exposed to direct fuel costs, may still face affordability challenges through other channels.

Taken together, the analysis shows that ETS2 impacts are multidimensional and unevenly distributed, both across and within Member States. A common EU-wide carbon price translates into diverse real-world outcomes, depending on structural, socio-economic and policy conditions.

The key implication is that effective mitigation requires targeted and differentiated approaches. Policies should not rely on aggregate or average effects but instead focus on the specific combinations of vulnerability that drive exposure – particularly households that are both economically constrained and highly dependent on fossil-fuel mobility, with limited access to viable alternatives.

2.3 Subtask 1.2: Mitigation measures and fuel taxes

This subtask examines national-level policy options to mitigate the price impacts of ETS2. We first conducted a review of the EU Energy Taxation Directive (ETD) and its proposed revision, to clarify the scope for Member States actions to adjust excise duties or apply exemptions. The findings were then taken into account in the identification and qualitative assessment of national mitigation measures, including fiscal instruments, targeted support schemes, and structural interventions that can reduce disproportionate household exposure to higher fuel costs.

The outputs of this subtask are presented in this report, which synthesises the analysis undertaken to assess the impacts of the revised Energy Taxation Directive (ETD) and related national mitigation measures. Drawing on a structured assessment of the relevant ETD and recast provisions against the research questions and indicators set out below, as well as a review of national mitigation measures and their distributional, fiscal and policy implications, the report presents the key findings, conclusions and supporting evidence in an integrated format.

2.3.1 Step 1: Analysis of the Energy Taxation Directive

Aim

The objective of this step was to clarify the role that fuel taxation under the Energy Taxation Directive (ETD) can play in shaping or mitigating the fuel price impacts generated by ETS2. While ETS2 introduces an additional carbon cost on fuels used in road transport and buildings, final retail fuel prices are also determined by national excise duties regulated under the ETD. Understanding how these two policy instruments interact is therefore essential to assess the extent to which Member States can use fuel tax policy to cushion or modulate the price effects of ETS2 while preserving the integrity of the carbon price signal.

Methodology

The task started with an initial review of the EU Energy Taxation Directive (ETD, 2003/96/EC) and its proposed revision (COM (2021)563), intended to modernise the directive by aligning excise duties with carbon content and environmental performance, broaden the tax base and phase out many existing exemptions and reductions that do not reflect climate policy objectives. This revision is particularly relevant in the context of ETS2, as it aims to align fuel taxation more closely with carbon pricing, potentially reducing the scope for Member States to offset ETS2 price signals through tax reductions.

The review of the ETD and revision aimed to analyse how the ETD constrains or enables national fuel tax adjustments in response to ETS2-driven price increases, by highlighting the specific provisions that define the flexibility for adjusting excise duties, granting exemptions, or applying reduced rates. Attention was given to provisions that determine whether Member States can temporarily offset ETS2 price increases through fuel tax reductions or other fiscal adjustments.

Key research questions included:

- How do fuel excise duties regulated under the ETD interact with the additional carbon cost introduced by ETS2 in determining final fuel prices?
- To what extent can Member States adjust excise duties to offset or smooth ETS2-induced fuel price increases while remaining compliant with ETD minimum tax levels?
- What legal mechanisms exist within the ETD framework (e.g. exemptions, reduced rates, or derogations) that could allow Member States to temporarily mitigate ETS2 price impacts?
- How would the proposed ETD revision affect the ability of Member States to use fuel taxation as a mitigation tool in response to ETS2, particularly in light of the proposed alignment of minimum tax rates with carbon content?

To complement the analysis, a review was undertaken of selected examples of Member States that have applied provisions in practice after receiving authorisation under Article 19 to apply reduced excise rates below the ETD minima for petrol and diesel as a temporary social policy measure. These examples provide context and illustrate the practical scope for national price mitigation measures.

2.3.2 Step 2: Identification and assessment of national mitigation measures

Aim

Following step 1, the aim of step 2 was to identify a list of national policy measures for price mitigation and improving mobility infrastructure to promote decarbonisation in the transport sector.

Methodology

We drew on policy literature and expert studies - including the European Commission study on supporting measures supporting decarbonisation in ETS2 sectors[18] and the EEA report (authored by Ricardo) on EU ETS2 and Social Climate Fund: Enabling decarbonisation in transport and buildings that works for all[19], and the review of SCPs for Sweden, Lithuania and Latvia to catalogue options such as:

- Temporarily lowering fuel excise duties;
- Offering targeted cash rebates or fuel vouchers to vulnerable drivers;
- Using ETS2 auction revenues for general tax cuts;
- Creating a “national carbon price corridor”: i.e. adjusting excise taxes dynamically so that the total tax and ETS price stays within a floor/ceiling (T&E, 2025).
- Supporting uptake of lower carbon transport options, e.g., social leasing for EVs, on demand transport infrastructure investments, financial incentives for charging infrastructure

For each of the measures we noted their funding source, including whether they can be funded through ETS2 revenues allocated to the Social Climate Fund, ETS2 revenues allocated to the national budget or other funding sources at EU/ national level.

Each measure was assessed qualitatively against four criteria:

- expected distributional effects across income groups;
- fiscal sustainability;
- its interaction with ETS2 price signals;
- legal feasibility under the current Energy Taxation Directive framework

For the national mitigation measures specifically relating to fuel prices for final consumers, we assessed in more detail their scope and potential constraints for such measures under the current and future Energy Taxation Directive. This assessment built directly on the legal flexibilities and constraints identified in Step 1, ensuring that each mitigation option was evaluated in terms of what the ETD currently allows or would allow under its proposed revision.

For price mitigation measures, we explicitly compared broad-based measures, such as uniform excise reductions, with targeted compensation schemes. While broad reductions dampen visible price increases for all consumers, they weaken the carbon price signal and provide proportionally greater absolute benefits to high-consumption households.

[18] A study of supporting measures promoting decarbonisation in the sectors covered by ETS2 : - Publications Office of the EU
[19] ETC CM report 2025/09: EU ETS2 and Social Climate Fund: Enabling decarbonisation in transport and buildings that works for all — Eionet Portal

Targeted measures may be more efficient from an equity perspective but require administrative capacity and accurate targeting. Indirect financial and structural measures, such as accelerated investment in public transport, financial support for vehicle replacement or charging infrastructure expansion, were also reviewed insofar as they mitigate exposure structurally rather than directly altering prices.

2.3.3 Key Findings

Step 1: Analysis of the Energy Taxation Directive

Review of the proposed ETD revision (COM (2021)563). Findings against:

To support this assessment, a detailed mapping of the relevant provisions of the Energy Taxation Directive (ETD, Council Directive 2003/96/EC) and the proposed ETD recast has been developed and is included as an addendum to this report. The mapping cross-references each provision against the four guiding questions set out below, and records, for each, its contribution to fuel price formation and the degree of flexibility it affords Member States. The following subsections summarise the key findings of this exercise.

How fuel excise duties under the ETD interact with the additional carbon cost introduced by ETS2 in determining final fuel prices?

The provisions most relevant to this question are Article 4 (minimum levels of taxation), Article 7 (minimum levels for motor fuels), Article 9 (minimum levels for heating fuels) and Article 22 (treatment of stocks upon rate changes) of the current ETD, together with Article 1 (energy-content-based taxation, EUR/GJ) and Article 4 of the proposed recast. To assess these, the mapping records two things for each provision: first, whether it forms part of the excise duty component of the final fuel price, a component that sits alongside, rather than replaces, the ETS2 carbon cost; and second, the degree to which the provision constrains Member States' ability to adjust that excise duty component.. Under Article 4 of the current ETD, Member States must apply excise duty at or above a binding EU-wide minimum rate; this minimum acts as an absolute floor that no Member State may reduce below, regardless of domestic price pressure. It should be noted that the final retail price of a fuel also includes cost components beyond excise duty and the ETS2 carbon cost, such as the pre-tax cost of the fuel itself (crude oil or feedstock, refining, transport and distribution) and retailer margin; the point relevant to this assessment, however, is narrower and specifically concerns the tax and carbon-cost components, which are additive to one another, meaning that once excise duty reaches its binding minimum, it cannot be reduced further to absorb the additional ETS2 carbon cost. Article 7 sets this EU-wide minimum excise duty levels for motor fuels. National excise duty rates in several Member States already sit close to this binding minimum, as such, the scope to absorb ETS2-driven increases through further duty cuts is limited from the outset; Article 9 performs the same function for heating fuels, which are also under the scope of ETS2 with motor fuels. Article 22 confirms Member States can adjust taxation on existing stocks (fuel that has already been released for consumption and entered the supply chain but has not yet reached the final consumer), whenever excise duty rates change. This affects how quickly a duty change feeds through to the price actually paid by consumers, since it allows the new rate to be applied to stock already in the supply chain rather than only to fuel released after the change takes effect. Under the proposed recast directive, Article 1 marks a structural shift away from the current volume-based approach to excise taxation (duty calculated per litre or per 1,000 litres) toward taxing the energy content of the fuel, expressed in EUR per gigajoule (EUR/GJ) based on net calorific value, which mirrors more closely how ETS2 prices are calculated based on carbon content, tightening the link between the two cost components and reducing the scope to decouple excise duty from the carbon signal.

Extent to which Member States can adjust excise duties to offset or smooth ETS2-induced price increases while remaining ETD-compliant

This question draws on Article 4, Article 5 (differentiated rates), Article 7(2)-(4) (commercial/non-commercial gas oil, road-user charging), Article 8 (minimum levels for non-road industrial/commercial use), Article 11 (business/non-business use) and Article 18 (Member State-specific derogations) of the current ETD, alongside Article 5 of the recast directive, which introduces a mandatory ranking of minimum rates and annual inflation indexation. The mapping assesses each provision according to the "headroom" between a Member State's current tax level and the ETD minimum, and whether it permits differentiation by use, user group or fuel type. Article 4 sets an absolute floor below which excise duty cannot fall below regardless of ETS2 pressure, so the room for adjustment depends on how far above this floor a Member State currently sets its excise duty rate. Article 5 permits differentiated rates for specific uses, such as public transport, disabled persons, and business versus non-business use, enabling targeted rather than blanket relief, while Article 7 allows differentiation between commercial and non-commercial gas oil and the use

of road-user charging as an alternative burden-management tool. Article 8 sets a separate, generally lower minimum for non-road industrial/commercial fuel use, though this is less directly relevant to the road transport and buildings fuels captured by ETS2. Article 18 illustrates that country-specific transitional periods have historically been granted where price stability was at risk. These were one-off arrangements agreed at the point the 2003 Directive entered into force, allowing some Member States (including Spain, Austria, Belgium, Luxembourg, Portugal and Greece) to phase in the new minimum excise duty rates gradually rather than immediately, with deadlines that have since passed (generally between 2007 and 2012, as set out in Annex II of the Directive). Article 18 is a closed, historical mechanism rather than an open-ended tool, and does not itself provide a route for new, ETS2-specific transitional relief; a Member State seeking fresh flexibility to manage ETS2 price impacts would instead need to rely on Article 19, which allows the Council, acting unanimously on a Commission proposal, to authorise new exemptions or reductions for specific policy considerations, subject to a maximum six-year authorisation. Under the recast directive, however, Article 5 requires Member States to preserve the relative ranking of minimum rates between fuels and introduces automatic annual inflation indexation, which constrains future flexibility considerably compared with the current regime.

Legal mechanisms within the ETD framework that could allow temporary mitigation of ETS2 price impacts

The relevant provisions here are Article 6 (mechanism for granting exemptions, reductions and refunds), Article 14 (aviation/maritime exemptions), Article 15 (exemptions/reductions for renewables, households, agriculture and rail/public transport), Article 16 (reduced rates for biofuels/biomass), Article 17 (reductions for energy-intensive business), Article 18 (Member State derogations) and Article 19 (Council-authorised exemptions) of the current ETD, together with the equivalent Articles 6, 13, 16, 17, 18 and 20 of the recast. For each article, the mapping records the type of legal mechanism involved, whether a direct rate reduction, an exemption, or a refund can be applied, the targeted beneficiary group, and any time limit or procedural condition such as Council unanimity. Article 6 sets out the three core tools available, namely direct rate reduction, differentiated rates, and refunds, which together underpin most mitigation measures. Article 15 is the broadest of these, permitting total or partial exemptions across renewable-sourced electricity and fuels (specifically, electricity from solar, wind, wave, tidal or geothermal sources, hydraulic installations, biomass or biomass-derived products, and products used in pilot projects for renewable fuel development), as well as households, and represents a principal route for offsetting ETS2 costs for vulnerable groups,; Article 16 complements this with reduced rates for biofuels and biomass-derived products, providing further incentive for a demand shift towards fuels less exposed to the carbon price. Article 17 offers a further targeted mechanism for energy-intensive businesses, including the possibility of reducing taxation to zero. Article 14 confirms aviation and maritime fuels (EU ETS) already benefit from structural exemptions, though the mapping notes that these function as fixed exemptions rather than flexible policy levers. Article 19 provides a general procedure for any Member State to seek Council-approved exemptions for specific policy reasons, subject to a maximum six-year authorisation. Collectively, these provisions confirm a broad legal toolkit already exists to mitigate ETS2 impacts, though the most powerful instruments, Articles 15 and 17, are conditional and sector or group-specific rather than economy-wide.

Further detail on these national mitigation measures is provided in the 'Step 2: Identification and assessment of national mitigation measures' section.

Effect of the proposed ETD revision on Member States' ability to use fuel taxation as a mitigation tool, in light of alignment with carbon content

This question is addressed through Article 1 (energy-content taxation), Article 2 (extended scope to low-carbon/renewable fuels), Article 5 (mandatory ranking and indexation), Articles 7-10 (phased increases in minimum rates to 2033), Articles 14 and 15 (phased-in aviation/maritime taxation), Article 17 (household/vulnerable household reductions) and Article 18 (energy-intensive business reductions) of the recast directive. The mapping compares each of these provisions against its current ETD equivalent, recording whether Member States' flexibility to use fuel taxation as a mitigation tool against ETS2 price impacts increases or decreases, and whether new protected categories, such as vulnerable households, are introduced. The recast directive shift to energy-content-based taxation under Article 1 aligns the tax base more closely with the carbon intensity underlying ETS2, narrowing the scope to treat the two cost components independently. Article 5 reinforces this by requiring Member States to preserve a fixed ranking between the minimum excise duty rates set out in Annex I for different fuels and introducing automatic annual indexation, removing much of the ad-hoc discretion available under the current Directive. Articles 7-10 phase in higher minimum rates, at one-tenth of the total increase annually to 2033, steadily raising the floor below which duty cannot be cut and narrowing the space for tax-based mitigation over time. Articles 14 and 15 extend excise taxation to aviation and maritime fuels for the first time, on a phased basis, introducing a new tax component

in sectors the EU ETS is also extending into. At the same time, the recast directive preserves and, via Article 17, strengthens certain targeted tools for price mitigation. Notably, a new ten-year exemption for vulnerable households defined against the at-risk-of-poverty threshold[20], representing more socially targeted relief than currently exists. Overall, the mapping indicates the proposed revision reduces Member States' general capacity for blanket tax reductions while introducing narrower, better-targeted relief for specific vulnerable groups and industries.

Step 2: Identification and assessment of national mitigation measures

The national policy measures assessed under step 2 comprise measures aimed at price mitigation and measures intended to improve mobility infrastructure and support decarbonisation in the transport sector. The assessment draws on two main sources: the national Social Climate Plans submitted by Member states and the *study of supporting measures promoting decarbonisation in the sectors covered by ETS2*. Additional desk research was undertaken to identify and assess price mitigation measures. The findings of this assessment are summarised in the table below and synthesised throughout this report.

Price mitigation measures

Annex II of Council Directive 2003/96/EC sets out the country-specific reduced rates of taxation and exemptions that Member States were authorised to continue applying under Article 18(1) at the time the current ETD entered into force. These derogations pre-date, and are entirely separate from, any measures Member States might introduce in response to ETS2; they instead reflect a range of historical, sector-specific and often time-limited arrangements agreed at the point the Directive was adopted. The table below summarises the price mitigation measures introduced by some Member States, either as a direct response to ETS2 or as a result of the energy crisis triggered by the conflict in the Middle East.

Table 2-4 Member States Price Mitigation Measures

Member State	Measure	Type	Classification
Germany	Coalition of governing parties agreed to hold the national carbon price (BEHG/nEHS, the national equivalent mechanism preceding ETS2) within the statutory €55–65/tonne corridor through 2027 rather than letting it rise toward the ~€80 level originally projected, explicitly to ease the transition into EU-wide ETS2 pricing[21]	Direct ETS2 response	Uniform / broad-based
Germany	"Energie-Sofortprogramm": Energy excise duty (Energiesteuer) on diesel and petrol cut by approximately €0.17/litre (gross) for two months, financed via measures targeted at the mineral oil industry[22]	Action taken in response to the broader energy crisis (Middle East, 2026)	Uniform / broad-based
Poland	VAT on motor fuels temporarily cut from 23% to 8%, and excise duty reduced to the EU minimum (29 groszy/litre petrol, 28 groszy/litre diesel), effective 31 March–30 April 2026.[23]	Action taken in response to the broader energy crisis (Middle East, 2026)	Uniform / broad-based
Spain	Real Decreto-ley 7/2026 (20 March 2026): hydrocarbon excise duty (Impuesto sobre Hidrocarburos) reduced to the minimum level permitted under Directive 2003/96/EC, and	Action taken in response to the broader energy crisis (Middle East, 2026)	Uniform / broad-based

[20] Article 17 of the recast ETD Directive defines "vulnerable households" as households significantly affected by the impacts of this Directive which, for the purpose of this Directive, are below the "at risk of poverty" threshold, defined as 60% of the national median equivalised disposable income.
[21] BMUKN: From 2026: Relief for consumers despite rising CO2 price | Press release
[22] Federal Ministry of Finance - Immediate energy programme and relief premium
[23] VAT on motor fuels temporarily cut from 23% to 8%, and excise duty reduced to the EU minimum (29 groszy/litre petrol, 28 groszy/litre diesel), effective 31 March–30 April 2026, later extended to 30 April 2026

Member State	Measure	Type	Classification
	electricity excise duty cut both effective 22 March–30 June 2026[24]		
Italy	Series of Ministerial Decrees (Ministero dell'Economia e delle Finanze, jointly with Ministero dell'Ambiente) temporarily re-determined excise duty rates on petrol, diesel and LPG multiple times between March and August 2026.[25]	Action taken in response to the broader energy crisis (Middle East, 2026)	Uniform / broad-based
Portugal	Government approved a series of temporary, automatically-triggered reductions to the ISP (Imposto sobre os Produtos Petrolíferos e Energéticos) via formal Portarias (ministerial orders), each time fuel prices rose by more than 10 cents/litre versus the 2–6 March 2026 baseline, effectively returning the additional VAT revenue generated by the price increase back to consumers[26]	Action taken in response to the broader energy crisis (Middle East, 2026)	Uniform / broad-based
Sweden	Formally requested (and was granted) a Council Implementing Decision under Article 19 of the ETD to apply reduced excise duty on petrol and unmarked gas oil below the ETD minimum, citing sharp fuel price rises; validity capped at 3 months (the maximum period allowed under Article 19(2))[27]	Action taken in response to the broader energy crisis (2022 fuel price shock)	Uniform / broad-based

Indirect financial/ structural measures

The remaining measures underpinning this assessment were drawn from two main sources: a study of supporting measures promoting decarbonisation in the sectors covered by ETS2[28], which covers measures such as emission-based vehicle taxation, public transport ticketing, on-demand transport, corporate tax treatment of company cars and charging infrastructure incentives; and the national Social Climate Plans submitted by individual Member States (including Sweden, Croatia, Greece, Latvia, Bulgaria, Cyprus and Lithuania), which set out household- and micro-enterprise-facing measures such as electric vehicle purchase and leasing support, vehicle premiums, charging point rollout and on-demand rural transport services.

Indicators

For each of the measures collected we noted their funding source, including whether they can be funded through ETS2 revenues allocated to the Social Climate Fund, ETS2 revenues allocated to the national budget or other funding sources at EU/ national level. Other indicators collected for each measure include: whether it can be considered as price mitigation or an indirect financial/structural measure; whether it also serves a decarbonisation objective; the stakeholders reached (citizens, vulnerable households, SMEs/micro-enterprises, or freight and vehicle operators); the eligibility criteria applied; the annual public cost; the revenue impact on public finances; the degree of dependence on continued public funding; whether the measure is automatically triggered by the ETS2 price or instead operates independently of it; any limits or constraints on the measure noted in the source reports; its relevance to, and consistency with the Energy Taxation Directive (price mitigation measures); and the degree of flexibility Member States retain in designing or adjusting the measure.

These indicators were used to qualitatively assess each measure against four criteria:

[24] BOE-A-2026-6544 Real Decreto-ley 7/2026, de 20 de marzo, por el que se aprueba el Plan Integral de Respuesta a la Crisis en Oriente Medio.
[25] Official Journal
[26] Portaria n.º 107-G/2026/1, de 6 de março | DR
[27] EUR-Lex - 52022PC0398 - EN - EUR-Lex
[28] European Commission: Directorate-General for Climate Action, Ricardo and Öko-Institut e.V, [Directorate-General for Climate Action, Ricardo, Öko-Institut e.V], *A study of supporting measures promoting decarbonisation in the sectors covered by ETS2:*, Publications Office of the European Union, 2025, **https://data.europa.eu/doi/10.2834/2777563**

- **Expected distributional effects across income groups:** This was assessed primarily using the stakeholders-reached and eligibility-criteria indicators, supplemented by any distributional impact assessment reported in the source material. Measures explicitly targeted at vulnerable households or transport-poor groups, such as Sweden's targeted electric car premium or Lithuania's zero-emission vehicle support for families with children and persons with disabilities, were assessed as strongly progressive, whereas broader measures such as bonus-malus vehicle taxation or reduced public transport ticketing were assessed as only potentially progressive, depending on whether revenues are recycled toward lower-income groups or accompanied by complementary support.
- **Fiscal sustainability:** This was assessed using the annual public cost, revenue impact and dependence-on-public-funding indicators together. Measures generating their own revenue stream or designed to be broadly self-financing, such as Austria's NoVA registration tax or Eurovignette CO_2-based tolling, were assessed as having low dependence on continuous public funding. By contrast, purchase and leasing subsidies funded through Social Climate Plans, such as those in Sweden, Croatia, Greece, Latvia, Bulgaria, Cyprus and Lithuania, were assessed as having a negative fiscal impact and high dependence on public funding, since they require sustained grant expenditure over multi-year implementation periods.
- **Interaction with ETS2 price signals:** This was assessed using the "does ETS2 price trigger the measure" and "interaction with ETS2 price signal" indicators. Most measures do not automatically adjust in response to the ETS2 carbon price but were nonetheless assessed as showing strong complementarity, in that they reinforce the behavioural shift toward zero-emission mobility that ETS2 is intended to incentivise. The Eurovignette measure stands out as the only one with an explicit, direct interaction, since the source material notes that the maximum CO_2 external-cost charge applicable to tolling may need to be reduced from 2027 because ETS2 will already partially internalise the same carbon cost.
- **Legal feasibility under the current Energy Taxation Directive framework:** This was assessed using the ETD-relevance, Member-State-implementation-flexibility, and interaction-with-ETS2/EU-legislation indicators. The large majority of measures reviewed, including vehicle taxation, ticketing schemes, corporate tax deductibility and Social Climate Plan subsidies, were assessed as sitting outside the scope of the ETD altogether, since they operate through vehicle taxation, corporate tax, public transport pricing or direct grants rather than energy product excise duty, and therefore carry low legal risk from an ETD perspective. The Eurovignette measure was again the exception, assessed as carrying moderate legal risk, since it is governed by the Eurovignette Directive rather than the ETD. While the Eurovignette framework already differentiates road charges by vehicle CO2 emissions and allows Member States to omit its CO2-based external cost charge where a fuel carbon-pricing measure such as ETS2 already applies, this remains a discretionary, Member State-level choice rather than a harmonised rule; as the two instruments operate under separate legal bases and institutional processes. Closer alignment may still be needed to ensure the combined price signal from Eurovignette charges and ETS2 is applied consistently once ETS2 takes effect.
- Of the seven measures identified in the table above, only Germany's decision to hold its national carbon price (BEHG/nEHS) within the €55–65/tonne corridor through 2027, rather than allowing it to rise toward the originally projected level of approximately €80/tonne, constitutes a genuine ETS2 response. This measure was explicitly designed to ease the transition into EU-wide ETS2 pricing from 2028. The remaining six measures were introduced in reaction to the 2026 Middle East-driven fuel price shock, or, in Sweden's case, an earlier 2022 shock, and are included only as illustrative examples rather than confirmed ETS2 mitigation. Assessed against the four criteria applied throughout this report, Germany's measure is regressive in its expected distributional effects across income groups. It applies uniformly to all consumers of heating and transport fuel. It is relatively durable from a fiscal sustainability perspective, as it constrains a projected future price increase rather than reversing an existing revenue stream. Its interaction with ETS2 price signals is direct and explicit, as the measure is specifically designed to smooth the domestic carbon price trajectory ahead of the national scheme's conversion into ETS2 in 2028. Finally, it raises no legal feasibility concerns under the current Energy Taxation Directive framework, since it operates entirely through Germany's national carbon-pricing law rather than through excise duty, placing it outside the scope of the ETD altogether.

Analysis of measures

For the measures specific to fuel prices (price mitigation), we have also examined specific constraints from the ETD relating to their implementation and the effectiveness of uniform excise reductions vs targeted compensation.

Constraints for such measures

For the national mitigation measures specifically relating to fuel prices for final consumers, we have assessed in more detail their scope and potential constraints under the current and future Energy Taxation Directive, building directly on the legal flexibilities and constraints identified in Step 1.

A notable finding from this exercise is that there are 28 measures identified in our assessment that do not directly address price mitigation, as they do not operate through the ETD's own excise duty mechanism and seven measures that address price mitigation. The eligibility assessment records "No" for ETD relevance across the vehicle taxation schemes, reduced public transport ticketing, CO_2-based company car tax deductibility, the Eurovignette tolling measure, and the range of Social Climate Fund-financed vehicle premiums and leasing schemes. Member States have so far heavily relied on these adjacent levers (Financial incentives for behavioural change), namely vehicle registration and acquisition taxation, corporate tax deductibility, public transport pricing, tolling under the Eurovignette Directive, and direct grant-based subsidies under national Social Climate Plans, rather than adjusting fuel excise duty itself under Articles 6, 7, 9 or 15 of the current ETD (as set out in Step 1).

Desk research indicates that the mitigation measures currently observable at Member State level are, in most cases, a response to the fuel price increases resulting from the ongoing conflict in the Middle East rather than to ETS2 itself. This suggests that, in practice, Member States are treating ETD-based excise duty adjustment as a secondary or residual tool rather than the primary channel for price mitigation, likely reflecting the binding minimum-rate floor under Article 4 and, prospectively, the tighter rate-ranking and indexation rules under Article 5 of the recast directive identified in Step 1 as narrowing this space over time. This is reinforced by the design of the Social Climate Fund itself, which is not available as a route for excise duty adjustment either: Member States cannot draw on ETS2-linked SCF revenue to fund a reduction in excise duty. The only measure with a direct and explicit legal interaction with EU carbon-pricing legislation is the Eurovignette truck tolling scheme (Austria, Belgium, Czechia, Denmark, Germany, Estonia, Hungary), which, although governed by the Eurovignette Directive rather than the ETD, may see its maximum CO_2-based external-cost charge constrained from 2027 onward precisely because ETS2 will already partially internalise the same carbon cost; this is the clearest case among the measures reviewed of a legal constraint arising from the overlap between two EU instruments.

Uniform excise reductions vs targeted compensation

The measures identified split fairly cleanly into two categories, which we set out below by individual measure, alongside the trade-offs this dual approach raises.

- Broad based measures vs targeted compensation: This pattern is visible in the broad-based measures reviewed: the bonus-malus emission-based acquisition and registration tax schemes (Austria, Estonia, Spain, Finland, France, Netherlands) apply to all private and business vehicle buyers without income-based eligibility criteria, and while potentially progressive if revenues are recycled, as France has done by adjusting bonus schemes for low-income households, they otherwise risk leaving high-emission vehicle costs disproportionately manageable for wealthier buyers. Austria's 2020 NoVA reform (raising the maximum tax rate to 80%, doubling the emissions penalty, and lowering the penalty threshold) generated an estimated €100 million in additional revenue from 2025 registrations, partially offset by a €23 million reduction in fuel tax revenue over the vehicles' useful life — illustrating that even a well-designed uniform scheme carries fiscal trade-offs. Total annual NoVA revenue across all registrations is substantially higher, exceeding €500 million per year since 2023 (€546.6 million in 2024)[29]. Similarly, reduced and simplified public transport ticketing (Netherlands, Austria, Germany, Luxembourg) is broadly accessible to the general population rather than income-targeted, and while likely progressive in effect, since lower fares disproportionately benefit lower-income and vulnerable transport users, it requires continuous public funding. This is also illustrated by Austria's KlimaTicket costing approximately €160 million in federal funding in 2022 plus a further €180 million in support to regional governments, without any mechanism linking the subsidy level to the ETS2 price itself. CO_2-based tax deductibility for company cars (Belgium) operates similarly on a uniform basis across qualifying businesses of all sizes, generating a negative but moderate revenue impact through foregone tax receipts rather than direct budget outlay.
- Targeted measures may be more efficient from an equity perspective but require administrative capacity and accurate targeting: This is best illustrated by the Social Climate Fund-financed measures, which are explicitly

[29] Abgabenerfolg des Bundes (UG16)

designed around vulnerability criteria. Sweden's targeted electric car premium (up to SEK 46,800 per vehicle, financed 75% from the SCF and 25% from national contribution, at a total cost of approximately EUR 519.6 million) is explicitly framed as support for "vulnerable transport users affected by ETS2," with quantified targets distinguishing transport-poor households (36,800 EVs) from other vulnerable users (78,795 EVs). Lithuania's zero-emission vehicle support for vulnerable transport users, particularly families with children and persons with disabilities, is assessed as strongly progressive, though the requirement for households to contribute EUR 3,000–5,000 illustrates the administrative and affordability tension inherent in targeted design, since it may still exclude the lowest-income households from a scheme intended to serve them. The same issue appears in Latvia's leasing scheme and vehicle-purchase aid for vulnerable transport users, Greece and Cyprus's electric vehicle social leasing schemes, and Bulgaria's support for micro-enterprises and healthcare-related vehicle purchases: all are assessed as potentially highly progressive, but several source documents note that eligibility criteria and vulnerability definitions are not always precisely specified, which raises the administrative burden of accurate targeting flagged in the criterion above. All of these measures share a common fiscal profile: high dependence on public funding and a negative revenue impact, financed through the Social Climate Fund at the standard 75%/25% EU/national co-financing split, and while none are directly triggered by the ETS2 price, all are assessed as showing strong complementarity with ETS2 by helping recipients absorb higher fossil-fuel costs through vehicle electrification.

- Non-financial measures, such as accelerated investment in public transport, support for vehicle replacement or charging infrastructure expansion. Several measures in the dataset fall into this category and were not flagged as direct price mitigation but nonetheless reduce households' and businesses' structural exposure to rising fuel costs. These include on-demand transport services addressing rural connectivity gaps (Belgium, Germany, Ireland, Netherlands, Spain, and separately in Latvia and Lithuania's Social Climate Plans), public charging price transparency initiatives (Germany, Portugal), urban transport planning through the Superblock model for redistributing public space (Spain, Austria, Germany), and the streamlining of grid-connection administrative processes (Netherlands, UK).
- Other financial incentives include heavy-duty vehicle charging infrastructure including grid connection (Germany, Spain, France, Italy). At national plan level, Lithuania's investments in publicly accessible and private recharging points, on-demand transport, zero-emission school buses, and public transport development, together with Latvia's road transport on-demand service and its supporting regulatory framework, all serve this structural function: none directly alters the price a consumer pays for fuel, but each reduces the degree to which households and businesses remain dependent on fossil-fuel transport as ETS2 pricing takes effect.
- The Table 2-4 above sets out the price mitigation measures identified through desk research across six Member States. Of these, only Germany's decision to hold its national carbon price (BEHG/nEHS) within the statutory €55–65/tonne corridor through 2027, rather than allowing it to rise toward the originally projected ~€80/tonne level, qualifies as a direct ETS2 response, since it was explicitly designed to ease the transition into EU-wide ETS2 pricing from 2028. The remaining measures identified, Germany's Energie-Sofortprogramm, Poland's VAT and excise duty cuts, Spain's Real Decreto-ley 7/2026, Italy's series of ministerial excise decrees, and Portugal's automatically triggered ISP reductions, are all analogous precedents introduced in 2026 in response to the fuel price increases resulting from the conflict in the Middle East, rather than to ETS2 itself. Sweden's Article 19 derogation is included as a further analogous precedent, though it dates from an earlier fuel price shock in 2022. While none of these six measures were legally or officially framed as ETS2 responses, they remain instructive: each demonstrates a specific legal or fiscal mechanism that the Member State concerned has already shown a willingness to deploy under acute fuel price pressure.

3. Policy tools, revenue use and uncertainty around the Social Climate Fund (Task 2)

3.1 Introduction

The aim of task 2 was to assess the flexibility that Member States have to effectively implement and fund policy measures from national revenues and those from the SCF. It consisted of two steps:

Step 1: Legal review of the ETS Directive and analysis of the measures based on national revenue allocation

The key aim of step 1 under Task 2 was to provide a legal review of the requirements placed on the allocation of revenues from the sale of ETS2 emissions allowances under the ETS Directive. With specific attention to be paid to the Priority Clause under Article 30(d)6. The second aim was to examine how these legal requirements are implemented in practice, through gaining a detailed understanding surrounding the flexibility that Member States (MS) have to effectively implement and fund policy measures that:

a. Promote decarbonisation in the road transport sector

b. Mitigate the impacts of ETS2 for consumers from the Social Climate Fund and National revenues

This is done through comparing the legal mapping results against the identified list of measures under task 1.2 and through SCP reviews under Step 2, to assess whether measures align with findings from step 1 surrounding flexibility around the use of ETS2 revenues.

Step 2: Analysis of the role of the SCF revenue

The aim of Task 2 - Step 2 was to analyse the role of the SCF and consider how the delayed and uneven progress of the SCPs and delay of ETS2 could affect the role of the SCF and the availability of other funding sources through a review of submitted/adopted SCPs. Including whether delayed submission may influence Member States ability to effectively implement the measures and actions outlined in their SCP funded from the SCF within the shortened timeframe of available funding, their ability to meet emission reduction targets by 2030 and whether measures planned to be implemented under the SCP will be funded by the SCF, other sources or both.

A key aim of the step was also to assess:

- The roll-out of measures supporting final consumers of fuels covered by ETS2 to mitigate price impacts
- The effects on investment certainty for projects rolled out to support decarbonisation improved mobility options in the Road transport sector
- The effectiveness of Mitigation Measures

In addition, the review of the SCPs accompanies the desk research to consolidate initial findings. Through the desk research a further aim of the step was to understand how different funding sources will interact under delay to submission of SCPs. All Member States were required to submit their draft SCPs by June 2025. To date only ten countries have submitted their plans and only the Swedish, Lithuanian, Latvian, Maltese and Greek SCPs have been officially adopted.[30]

The step aims to also understand the role of the European Investment Bank's €3 billion financing facility made available ahead of ETS2 implementation. Looking into aspects such as:

- Potential postponement of borrowing from the EIB (European Investment Bank) funding given the potential for unclear alignment with national priorities from non-submitted SCPs

[30] On September 1st 2026, only Croatia, Greece, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Slovenia and Sweden have submitted their SCPs. Social Climate Fund national plans - Employment, Social Affairs and Inclusion

- Lower demand for EIB financing due to a lack of clarity over projects qualifying for SCF – particularly where blended financing with the SCF is planned and the potential effect it may have on the number of projects moving forward.

3.2 Step 1: Legal review of the ETS Directive and analysis of measures based on national revenue allocation

3.2.1 Methodology

Legal review

In order to understand the flexibility that MS have surrounding use of revenues from ETS2 to fund policies and measures, a targeted review of the priority clause (Article 30d(6)) of the EU ETS Directive (Directive (EU) 2023/959) including the other relevant cited articles was carried out. This was complemented by a review of the Social Climate Fund Regulation (Regulation (EU) 2023/955). While the ETS Directive is the primary instrument governing the use of ETS2 revenues, the Social Climate Fund Regulation was also considered as it provides important context on how these revenues are channelled in practice.

To ensure a consistent and transparent methodology, we applied a structured, word-based analytical approach. This is grounded in the principles of EU law, whereby the legal effects of a provision can largely be inferred from the specific verbs and formulations used in the legislation. In particular, we relied on a classification of commonly used legislative terms to distinguish between binding obligations (hard law), discretionary provisions and non-binding or programmatic guidance (soft law) to ascertain:

- Constraints in terms of the revenues/requirements
  - The proportion of revenues allocated to the SCF and the remainder to national budgets per Member State
  - Types of measures that are applicable/tied to the SCF and those that would fall under other funding sources according to the legislation.
- Level of flexibility
  - The degree of flexibility a MS has in meeting requirements through existing fiscal, financial or regulatory measures, for example can revenues be earmarked for new or existing expenditures
- Means of proof of compliance and reporting requirements on Member States such as their National Energy and Climate Plans (NECP) and reporting against those, to highlight progress of adopted measures against reaching national targets and EU emission targets.

Table 7-9 in Annex 7.3 sets out the categories of wording used in the analysis, illustrating how each term typically appears in European Commission legislative drafting and the legal significance generally attached to it. While there is not a standard overview of European Commission language and its implications, the 2024 paper by Angerer[31] provides a definition of binding obligation (hard law) and non-binding obligation (soft law). The definition served as the basis for the categorisation presented in the table below, which was validated by WSP's legal experts.

Using this framework, we reviewed each relevant article of the EU ETS Directive and the SCF Regulation. For each provision, we systematically:

- Identified the key operative wording;
- Assessed whether the provision established a binding requirement, discretionary option, or non-binding guidance; and
- Interpreted the practical implications of the provision for Member States, in particular in terms of constraints on the use of revenues, available flexibility, and compliance and reporting expectations.

[31] Nicoletta Maresa Angerer, 2024. *Soft Norms, Strong Impact: The Significance of Soft Law in the Legal Order of the European Union with Special Consideration of the Work of the Venice Commission*. European Union Law Working Papers, No. 90

This structured approach allowed us to draw clear and comparable conclusions across the two legislative instruments and to translate the legal requirements into practical implications for Member States' policy choices. The results of the underlying assessment have been synthesised in Section 3.2.2 below.

Practical implications

An assessment of practical implications follows the legal review, covering what the legal acts mean for MS obligations and whether SCPs comply with the legal requirements. The understanding from the legal review was assessed against examples of actual SCPs to verify whether they comply with caveats and requirements. In particular, the assessment focuses on checking whether SCPs align with the envisaged flexibility of revenues. For instance, the assessment checked whether Sweden plans to use resources from its own national budget to cover at least 25% of SCP costs.

3.2.2 Key findings

Legal review

Step 1 provided a legal analysis of the EU ETS Directive and the Social Climate Fund (SCF) Regulation, drawing on the provisions mapped in the accompanying tables.

Treatment of national ETS2 auction revenues allocated to the SCF (earmarked revenues)

This analysis shows that the EU rules around ETS 2 revenues and the Social Climate Fund are quite strict, with limited room for manoeuvre. Member States do not have a choice about whether part of the ETS 2 auction revenues are used for the Social Climate Fund: the EU ETS Directive clearly requires that a set amount of allowances is auctioned and that the funds raised from 150 million allowances, together with additional allowances up to a maximum overall amount of EUR 65 billion[32], are made available to the Fund (Articles 30d(3) and 30d(4) of Directive 2003/87/EC). These funds are therefore earmarked by EU law and cannot be redirected to other national priorities. The remaining revenues generated from the auctioning of allowances referred to in Article 30d(5) remain under Member State control and are subject to the separate requirements set out in Article 30d(6) (see section below). Once funding is available, Member States must respect firm conditions:

- They must contribute at least 25% of the estimated total cost of their Social Climate Plans (Article 15 of Regulation (EU) 2023/955), through their national financial sources
- Use for the funds only approved purposes as set out in approved Social Climate Plans (Articles 3, 4, and 8 of Regulation (EU) 2023/955), which were required to be submitted by 30 June 2025 (Article 4(1) of Regulation (EU) 2023/955). As of September 1st 2026, Sweden, Latvia, Lithuania, Malta and Greece are the only Member States to submit a SCP and have it approved.
- Avoid replacing existing national spending (Article 13(2) of Regulation (EU) 2023/955)
- Report regularly to the Commission, through reporting under the National Energy and Climate Plans (NECPs) submitted under Regulation (EU) 2018/1999 (Article 30d(6) of Directive 2003/87/EC),
- Meet agreed milestones and targets in order to receive payments (Articles 7(2) and 17 of Regulation (EU) 2023/955)

At the same time, Member States do have some flexibility, but only within clearly defined limits. They can decide which eligible measures to include in their Social Climate Plans, such as investments in building renovation, clean transport, or temporary income support, and they can tailor these measures to national circumstances. More specifically, transport-related measures include financial support for the purchase or leasing of zero and low emission vehicles, deployment of recharging and refuelling infrastructure, promotion of active mobility, and measures to improve access to public and shared transport (Article 8(1)(f) and 8(1)(g) of Regulation (EU) 2023/955). Article 8(2) of Regulation (EU) 2023/955 foresees the possibility for Member States to provide income support to vulnerable transport users affected by the increase cost of road transport.

However, this flexibility follows a clear logic: choice first, rules after. If a Member State chooses to use certain options (for example, temporary income support), EU law then strictly limits how this can be done, including how long it can

[32] Since the ETS 2 postponement is not due to the conditions set out in Article 30k of Directive 2003/87/EC but to a legislative amendment, the total available amount of funds has stayed the same.

last, how much can be spent, and who must benefit (Article 8(2) of Regulation (EU) 2023/955). Overall, Member States can design how their Plans work in practice, but they cannot change the purpose of the funds, exceed spending limits, ignore conditions, or treat the Fund as general budget support. Access to and retention of the funding depends on following these rules closely.

Treatment of national ETS2 auction revenues not allocated to the SCF (non-earmarked revenues)

In addition to the resources made available to the Social Climate Fund (SCF), Member States receive revenues from the auctioning of ETS2 allowances pursuant to Article 30d(5) of Directive 2003/87/EC. The use of these national ETS2 auction revenues is governed by Article 30d(6). Article 30d(6) requires Member States to use these revenues, or the equivalent financial value of those revenues, for one or more of the purposes specified in Article 10(3) and Article 30d(6). These purposes cover climate, energy, transport and social policy areas, including support for zero- and low-emission mobility, public transport, and measures addressing the social impacts of ETS2 on low- and middle-income users. While the eligible purposes are broad, the equivalent-value requirement means that these revenues cannot be regarded as unrestricted budgetary resources.

The provision creates a binding obligation regarding the value and purposes of the measures supported, but does not require ETS2 auction revenues to be directly earmarked or linked to specific expenditure items. Instead, the focus is on demonstrating that an equivalent financial value is directed towards eligible purposes. For example, a Member State receiving €1 billion in ETS2 auction revenues would need to demonstrate that measures with an equivalent value support the objectives set out in Articles 10(3) and 30d(6). The obligation therefore attaches to the equivalent value of expenditure rather than to the specific revenues generated through the auctions.

This approach provides Member States with significant flexibility in how they comply with the requirements of Article 30d(6). They may rely on existing or new fiscal, financial or regulatory measures, and can choose the policy instruments, target groups and implementation mechanisms that best fit national circumstances. Where relevant measures are already in place, Member States are not required to establish new programmes solely to accommodate ETS2 revenues, provided that the existing measures contribute to the eligible objectives and can be shown to have a value equivalent to the revenues generated.

Compared to the SCF, this framework is subject to a lower level of ex-ante control. The use of non-earmarked ETS2 revenues does not require prior Commission approval, predefined milestones, or payment conditionality. Instead, compliance is monitored ex-post through reporting obligations under Regulation (EU) 2018/1999, as required by Article 30d(6). As a result, transparency regarding the use of these revenues depends largely on the quality and detail of Member States' reporting and may therefore be lower than for SCF-funded measures.

There is nevertheless considerable overlap between the types of measures that can be supported under the two frameworks, including clean transport, energy efficiency, and measures addressing the social impacts of the transition. However, the SCF is specifically targeted at vulnerable households, vulnerable transport users and vulnerable micro-enterprises, and funding is conditional on approved Social Climate Plans, milestones and targets (Articles 4, 7 and 17 of Regulation (EU) 2023/955). By contrast, the use of non-earmarked ETS2 revenues is broader in scope and more flexible, but relies primarily on ex-post reporting and monitoring.

In practical terms, Member States retain discretion to determine the use of the non-earmarked ETS2 revenues, as provided for in Article 30d(6). However, this discretion is constrained by the requirement to demonstrate that the revenues, or an equivalent financial value, support the climate, energy, transport and social objectives set out in Articles 10(3) and 30d(6). Where Member States already have qualifying measures in place with an equivalent value, compliance may be achieved through those existing measures, reducing the need to establish additional programmes specifically linked to ETS2 revenues.

Member States can:

- Design their own Social Climate Plans, choosing from the list of eligible measures set out in EU law (such as support for vulnerable households, building renovation, or cleaner transport) (Articles 4 and 8 of Regulation (EU) 2023/955)
- Tailor measures to national circumstances, including using existing fiscal, financial or regulatory instruments, as long as they comply with EU rules (Article 30d(6) of Directive 2003/87/EC; Article 8 of Regulation (EU) 2023/955)

- Decide whether to include certain optional elements, such as temporary direct income support or the use of intermediaries, within the limits set by the legislation (Articles 4(3), 8(2) and 9 of Regulation (EU) 2023/955)
- Combine Social Climate Fund support with other EU or national funding, provided the same costs are not funded twice (Article 13(1) of Regulation (EU) 2023/955)
- Determine the use of national ETS2 revenues (Article 30d(5)), including within or outside Social Climate Plans, provided that the revenues, or an equivalent financial value, support the purposes defined in Article 10(3) and Article 30d(6) of Directive 2003/87/EC. Where Member States can demonstrate compliance through qualifying measures of equivalent value, the legislation does not require the direct earmarking of revenues to those measures
- Implement these purposes through existing or new measures, including fiscal, financial, regulatory policies, as long as these correspond in value to the revenues generated (Article 30d(6) of Directive 2003/87/EC)

Member States cannot:

- Treat the Article 30d(5) national ETS2 revenue-use obligation as unrestricted: the revenues or an equivalent financial value must correspond to the purposes permitted by Article 10(3) and Article 30d(6)
- Use the share of revenues earmarked for the Social Climate Fund for purposes other than financing the Social Climate Fund in accordance with Articles 30d(3) and 30d(4) of Directive 2003/87/EC
- Exceed legally defined financial ceilings, including caps on income support or maximum allocations (Articles 8(2) and 10(3) of Regulation (EU) 2023/955 and Article 30d(4) of Directive 2003/87/EC)
- Replace existing national spending with Social Climate Fund resources (no substitution) (Article 13(2) of Regulation (EU) 2023/955)
- Receive or retain SCF funding without meeting milestones, targets, reporting and monitoring requirements agreed with the Commission (Articles 6, 7(2), 16 and 17 of Regulation (EU) 2023/955)

Practical implications

To understand how the legislative requirements identified in the legal review are being translated into practice, the provisions of the EU ETS Directive and the SCF Regulation were compared against both the transport measures proposed in available Social Climate Plans (see Section 3.3) and the wider set of national transport measures identified under Task 1.2. This comparison provides an indication of how Member States are using the flexibility available under the legislation, the extent to which proposed measures align with the objectives of the SCF Regulation, and how existing national measures could potentially contribute to meeting the requirements associated with the revenues generated from the auctioning of allowances referred to in Article 30d(5).

The review of the transport measures proposed in the Social Climate Plans of Sweden, Lithuania and Latvia indicates a high degree of alignment with the objectives and eligible measures set out in the Social Climate Fund Regulation, particularly Articles 3, 8(1)(f), 8(1)(g) and 8(2). The majority of measures focus on supporting vulnerable transport users through access to zero- and low-emission vehicles, charging infrastructure, public transport, shared mobility and mobility-on-demand services, which are explicitly covered by the Regulation. The measures also broadly reflect the Fund's objective of mitigating the social impacts of ETS2 on vulnerable households, micro-enterprises and transport users. While most proposed measures appear to be clearly eligible, some may warrant further consideration during implementation. In particular, support provided through intermediaries, such as healthcare or social service providers in Latvia, would need to demonstrate that the ultimate beneficiaries are vulnerable groups, in line with Article 9(2) of the Regulation. Similarly, Latvia's proposed changes to the regulatory framework for road transport-on-demand services appear broadly consistent with Article 8(1)(g), as they are intended to enable the delivery of mobility-on-demand services for vulnerable transport users. However, eligibility may depend on demonstrating a clear link between the regulatory changes and the actual provision of accessible transport services, rather than broader transport sector reforms. Overall, the measures proposed by the three Member States are consistent with both the letter and the intent of the SCF Regulation, with only a limited number of measures requiring additional justification to demonstrate their direct contribution to the Fund's objectives.

A comparison with the wider set of national transport measures identified under Task 1.2 suggests that many Member States already have policies in place that are broadly aligned with the purposes set out in Article 10(3) and Article

30d(6) of the ETS Directive. Examples include bonus-malus vehicle taxation systems, public transport fare support, mobility-on-demand services, incentives for charging infrastructure, tax advantages for zero-emission vehicles, and road charging schemes favouring zero-emission heavy-duty vehicles. There is therefore a significant degree of overlap between the types of measures eligible under the Social Climate Fund Regulation and those already implemented at national level. This is particularly evident in areas such as zero-emission vehicle uptake, charging infrastructure, public transport, shared mobility and accessibility measures for vulnerable users. This overlap is relevant in light of Article 30d(6) of the ETS Directive, which allows Member States to fulfil their obligations by implementing fiscal, financial or regulatory policies with a value equivalent to the revenues generated from ETS2 auctioning. This suggests that, where Member States already have eligible transport, climate or social measures in place at a sufficient scale, compliance with Article 30d(6) may be achieved through these existing measures rather than through the creation of new ETS2-funded programmes. As a result, Member States may not need to establish additional spending schemes specifically linked to the non-earmarked share of ETS2 revenues, provided they can demonstrate that existing expenditure delivers support of equivalent value towards the eligible objectives set out in the Directive.

Instead, existing measures may form part of the compliance framework, provided they contribute to the eligible climate, transport and social objectives and can be demonstrated to have a value equivalent to the revenues generated.

The key practical implication is that national ETS2 auction revenues do not necessarily create an equivalent amount of public expenditure. A Member State receiving €1 billion in relevant ETS2 revenues does not have to earmark and directly spend those specific revenues on ETS2-related measures. Instead, it must be able to demonstrate that an equivalent financial value is used through eligible policies under Articles 10(3) and 30d(6) of the EU ETS Directive. Existing qualifying national policies may contribute towards this obligation.

This means that ETS2 auction receipts may enter the general budget, while existing expenditure or qualifying policies elsewhere in the national policy framework are used to demonstrate compliance with the equivalent value requirement. For the road transport sector, this is of particular importance. A Member State may already operate eligible measures, such as support for zero-emission vehicles, charging infrastructure or public transport. Subject to the conditions of Article 30d(6), these measures may contribute towards demonstrating the required equivalent financial value rather than the Member State having to establish a new programme specifically financed from ETS2 auction receipts.

3.3 Step 2 Analysis of the role of the SCF revenue

3.3.1 Method

Development of excel mapping for SCPs

To carry out task 2 step 2, a mapping was initially created in excel against which data was collected through a review of the adopted SCP of Sweden. Further reviews were carried out for the adopted Lithuanian and Latvian SCPs.

The mapping was developed with key metrics to be collected against specific measures as well as more general information fields. The roll-out of measures focused on the share of funding from the SCF over the total allocated budget and the extent of co-financing. The assessment of the effects on the investment certainty covered the project pipelines, the potential participation of the private sector in the investments and the alignment or misalignment with other EU policy funds. Finally, the risk of carbon lock-in, the effects on deployment of emission reducing technologies and the impact on public support for mitigation measures were the indicators for the effectiveness of the mitigation measures. A summary of the key metrics is highlighted in the table below:

Table 3-1. Key metrics for mapping measures in SCPs

Impact assessment criteria	Indicators	Measured by	Quantitative evidence	Qualitative evidence	Impact (low /medium /high)
The roll-out of measures supporting final consumers of fuels covered by ETS2 to mitigate price impacts	Risk of reduced or delayed assistance for vulnerable households and those in transport poverty	• Share of funding from SCF • Extent of co-financing			
The effects on investment certainty for projects rolled out to support decarbonisation improved mobility options in the Road transport sector	Project pipelines				
	Private sector participation in decarbonisation investment (private-public partnerships)				
	Misalignment with other EU policy funds, including EIB ETS2 Frontloading Facility	Is the measure co-financed?			
The effectiveness of Mitigation Measures	Effect on deployment of emission reducing technologies				
	Impact on public support for mitigation measures				
	Risk of carbon lock-in				

Metrics to ascertain Low/Medium/High Impact

Impacts of ETS2 delay are measured against multiple indicators based on quantitative and/or qualitative evidence. The translation of this evidence into values (low, medium and high) follows two steps: the definition of the values and their subsequent application.

- **Low impact** refers to the lack of, or minimal effects on the indicator assessed under the delay of SCP submission and consequent postponement to availability of funding from the SCF. This means that the measure is expected to miss its target in 2032 by less than 10%. This could refer to funding used, expected emissions savings, stakeholders effected etc. This will be a qualitative judgement where quantitative information is not available.
- **Medium impact** refers to where targets or/and funding were missed by between 10% and 35% of the original estimated value for the indicator being assessed.
- **High impact** implies that the postponement completely prevents the measure to be implemented (lack of funding) or achieve its targets.

As only the Swedish SCP provides revised targets and budget allocation in the case of ETS2 postponement, the assessment applied the reduction rates in Annex II Regulation (EU) 2023/955 to derive the national allocation to transport measures under a postponement scenario.

Desk research on the EIB frontloading facility financing

The availability of frontloaded grants under the SCF is linked to the agreed postponement of ETS2 by one year until 2028. These grants can be released through co-financing mechanisms, in particular, loans disbursed by a facility managed by the European Investment Bank (EIB). The relationship between these two instruments (SCF and the

EIB facility) and the implications for the SCP implementation will be explored under this task through desk research. The main sources are the available EIB documents[33] and the information in the official press releases from the European Commission[34].

3.3.2 Key findings

Results

The analysis covered the approved SCPs from Sweden, Lithuania and Latvia, reviewing the different planned investments and policy approaches. The Swedish SCP outlines a single measure for road transport (i.e. an aid to purchase EVs), while Lithuanian and Latvian SCPs plan a wide range of actions such as the installation of recharging points, the development of on-demand transport services and the purchase of zero emission buses. In particular, the Latvian SCP also targets specific job categories such as social care and healthcare providers.

The analysis focused on how the delayed and uneven progress of the SCPs and delay of ETS2 could affect the role of the SCF and the availability of other funding sources. The assessment aimed at answering three questions:

- Have the delayed SCP submissions and ETS2 postponement slowed down or prevent Member States (MS) from rolling out measures supporting final consumers of fuels covered by ETS2 to mitigate price impacts?
- Have the delayed SCP submissions and ETS2 postponement weakened investment certainty for projects, reducing private investments in improved mobility options?
- Has the ETS2 postponement hindered the ability of MS to effectively implement the measures and actions outlined in their SCPs?

Overall, the assessment found that the delayed SCP submissions and the postponement of ETS2 have had a medium impact on implementation and investments on average but with significant outliers due to the low or high level of ambition of some measures in the SCPs. The detailed findings of the assessment are synthesised in the sections below.

Roll-out of measures

Overall, the ETS2 postponement has had a medium impact on the roll-out of measures supporting final consumers of fuels covered by ETS2, to mitigate price impacts. As no assessed SCP envisages transfers from shared management programmes such as the European Regional Development Fund (ERDF) or the European Social Fund (ESF+) while national contributions cover the minimum share of the costs (25%), the roll-out of measures is highly dependent on the access to the SCF.

As the ETS2 postponement was not triggered by the activation of clauses, the national allocations from the SCF were not reduced: Sweden will receive €389,695,089, Lithuania €664,171,367 and Latvia €463,676,528. However, the reduction rates (-16% on average) in Annex II Regulation (EU) 2023/955 were adopted to derive the national allocation to transport measures under a postponement scenario where delays were due to clauses activation.

Therefore, according to the indicators – Share of funding from SCF and Extent of co-financing –, the ETS2 postponement has mildly impacted the roll-out of measures supporting final consumers. Even if national allocations from SCF have not been deducted, the delays to access funds has slowed down the full implementation since they are the main financing source of the SCPs.

Investment certainty

ETS2 postponement has provoked a medium to high impact when considering project pipelines and alignment with other EU policy funds, weakening investment certainty for projects aimed at supporting decarbonisation improved mobility options in the road transport sector.

The project pipelines have been mildly affected since they have been delayed by the late submission of SCPs. The Latvian and Lithuanian SCPs envisage the implementation of projects starting in 2027. Considering the SCPs were approved between the second and third quarters of 2026 and the Swedish SCP, submitted on time, has started implementation in the second quarter of 2026, the ETS2 postponement delayed access to the funds to implement measures by around 6 months.

[33] ETS2 FRONTLOADING FACILITY
[34] *Commission proposes targeted adjustments to the Market Stability Reserve Decision to support a smoother start for ETS2 - Climate Action*

Investments under the SCPs reviewed aligns with existing EU and national policy frameworks such as National Energy and Climate Plans (NECPs), National Recovery and Resilience Plans (NRRPs) and measures financed by the ERDF. In the case of Sweden and Latvia, they complement current measures, covering targeted groups or vehicles not benefitting from the existing incentives. Instead, the Lithuanian SCP mainly plans investments to continue support in, e.g., installing recharging points and purchasing zero emissions buses. The existing support for these measures will end since the measures are financed through the ERDF and the Recovery and Resilience Facility under the current Multiannual Financial Framework covering the period 2021-2027. This will be picked up by the SCF in 2027. The ETS2 postponement and the corresponding delays in accessing fundings has implied a large negative effect since no other programme finances the measure under the SCP except for the SCF.

Among the SCPs assessed, only the Latvian one is explicitly open to the possibility of a public-private partnership since private operators or municipalities will contribute to 15% of the costs for the installations of publicly accessible recharging points. Therefore, when focusing on the SCP implementation, ETS2 postponement has had no or low effect on the participation of private sector in decarbonisation investments. Instead, broadening the scope to investment mobilisation, ETS2 postponement and the delayed SCP submissions could have weakened the investment signals, reducing the credibility of policy commitments and pushing private investors to postpone their planned investments.

Effectiveness of Mitigation Measures

In general, ETS2 postponement has implied medium impact on the deployment of mitigation measures and their effectiveness.

As the Latvian and Lithuanian SCPs were approved in the second and third quarters of 2026 and implementation timelines start in 2027 mainly, the ETS2 postponement has delayed access to the funds to implement the planned measures.

Overall, the reviewed investments aim to cover more than 10% of their target group or satisfy needs by more than 10%. For example, in Lithuania, national targets envisage the installation of 54,000 private recharging points and 6,000 public ones by 2030. Through two investment measures, the Lithuanian SCP would contribute to the target for public recharging points by 16.7% and to the target for private recharging points by 12.7%. In Sweden, a delayed access to funds would lead to a reduction of the target by 16.2%. The postponement and potential loss of funding can have a medium impact on the risk of carbon lock-in. In few cases, there could be exceptions. For instance, a delay in funding would prevent Lithuania to cover aid for almost all the beneficiaries for the purchase of means of transport for social care and healthcare providers. Conversely, the impacts would be minimal for the implementation of incentives for the uptake of zero-emission light passenger and goods vehicles for micro-enterprises under the Latvian SCP since they would target less than 4% of the target group.

Results – Delayed submission of SCP effect on the availability of other funding sources

The availability of frontloaded grants under the SCF is linked to the agreed postponement of ETS2 by one year until 2028. These grants can be released through co-financing mechanisms, in particular, loans disbursed by the ETS2 Frontloading Facility managed by the European Investment Bank (EIB). The relationship between these two instruments (SCF and the EIB facility) and the implications for the SCP implementation were explored under this task through desk research.

Under the EIB ETS2 Frontloading Facility, Member States may submit to the EIB either their SCPs, a separate social-climate investment programme, or a combination of both, provided that the proposed investments meet the objectives and eligibility criteria of the facility, namely accelerating investments that improve the affordability, accessibility, and availability of low-carbon solutions in the building and transport sectors. The facility therefore offers Member States additional flexibility to bring forward investments before ETS2 revenues become available, while maintaining alignment with the objectives of the EU ETS Directive and the Social Climate Fund Regulation. Access to the facility is, however, conditional on the transposition of the ETS2 Directive into national legislation, and Member States are required to report to the EIB on the use of funds, with any expenditure on non-eligible measures subject to reimbursement. All the measures envisaged in the SCPs reviewed are eligible under the EIB ETS2 Frontloading Facility.

As mentioned above, investments under the SCPs reviewed align with existing EU and national policy frameworks such as NECPS, NRRPs and measures financed by the ERDF. However, no SCP plans to use transfers from shared

management programmes, forcing the implementation of measures to fully rely on the SCF and the EIB ETS2 Frontloading Facility as key funding sources.

To summarise, Member States that have already transposed the ETS2 Directive into their national legislation will have access to the facility. According to the EUR-Lex database of national transposition measures[35], all Member States except Spain had notified at least one measure related to the transposition of Directive (EU) 2023/959 as of July 2026. However, the notification of measures does not in itself demonstrate complete and correct transposition, which remains subject to verification by the European Commission. To maximise their ability to benefit from the Facility, Member States should prioritise the completion of the transposition.

[35] Directive - 2023/959 - EN - EUR-Lex

4. Interaction of ETS2 with other EU transport legislation (Task 3)

4.1 Introduction

This section assesses the potential interaction between ETS2 and selected elements of the following EU transport regulations and initiatives:

- Proposed amendments to the CO_2 emission standards for light-duty vehicles (LDVs);
- Proposed corporate fleets initiative for light-duty vehicles;
- Proposed amendments to the Car Labelling Directive;
- Upcoming review of the Alternative Fuels Infrastructure Regulation (AFIR);
- Renewable Energy Directive (RED).

The first three initiatives are part of the Automotive Package that the European Commission presented in December 2025 to support the automotive sector's efforts in the transition to clean mobility. The purpose of the assessment is to understand whether, and through which mechanisms, elements of these policies may interact with ETS2 and the potential impacts for consumers.

The section is structured as follows. First, it sets out the methodology used to assess the interaction between the selected policy elements and ETS2. It then applies this framework to each regulation or initiative in scope, identifying the likely interaction with ETS2 and the potential implications for consumers. Finally, a table with a summary of all the analysis is presented.

4.2 Methodology

The analysis focuses on the expected effects of policy elements on the uptake of zero-emission and low-emission vehicles, fossil fuel use, ETS2 prices, and consumer outcomes. The assessment is based on a literature review of European Commission impact assessments and NGOs and industry analyses and positions

For this assessment, the interaction between the policies in scope and ETS2 is assessed by considering how each policy element affects two main aspects:

- **Fleet composition**, meaning how the policy element changes the share of zero-emission (ZEV), low-emission (LEV) and internal combustion engine (ICE) vehicles entering the fleet; and
- **Fossil fuel use**, meaning whether the policy element reduces, increases or prolongs the use of petrol and diesel in road transport.

These two aspects therefore determine the extent to which a policy element may affect ETS2 allowance demand and carbon price pressure. Where a policy element reduces fossil fuel use, it can lower demand for ETS2 allowances and ease upward pressure on the ETS2 carbon price. Conversely, where a policy element increases or prolongs fossil fuel use, it can increase allowance demand and add upward pressure to the ETS2 carbon price.

Although ETS2 compliance obligations apply to fuel suppliers rather than directly to end users, ETS2 costs are expected to be passed through, at least in part, to consumers through fuel prices. The consumer impact of ETS2 will therefore depend not only on the carbon price affecting the fuel prices they pay, but also on the extent to which consumers remain dependent on fossil fuels and whether there are low-emission alternatives available to them. In parallel, each of these policy elements can have distributional implications if these elements of ETS2 affect affordability or availability in different ways for different types of consumers.

The overall interaction of the policy elements with ETS2 can therefore be understood as follows:

Table 4-1: Potential interaction of policy elements from other transport regulations with ETS2

Type of interaction with ETS2	Description	Expected ETS2 effect	Impact on consumers
Reduces consumer exposure to ETS2 cost impacts (+)	Policy elements that directly reduce fossil fuel demand by accelerating the uptake of zero-emission vehicles, improving vehicle efficiency, or expanding low-emission alternatives.	Reduces demand for ETS2 allowances and, therefore, reduces the ETS2 carbon price.	Improves consumers' ability to avoid ETS2-related fuel costs by: - Improving transport affordability - Increasing the availability of low-emission options.
Enables lower consumer exposure to ETS2 cost impacts (+)	Policy elements that do not directly reduce fossil fuel demand, but create enabling conditions for future reductions, such as supporting zero-emission vehicle uptake, infrastructure deployment, market readiness, or consumer access to alternatives.	No immediate direct effect on ETS2 allowance demand, but may support future reductions in allowance demand and carbon price pressure.	Improves consumers' ability to avoid ETS2-related costs by increasing the feasibility, attractiveness or availability of low-emission transport options.
Increases consumer exposure to ETS2 cost impacts (-)	Policy elements that increase or prolong fossil fuel demand by delaying zero-emission vehicle uptake, keeping fossil fuel vehicles in use for longer, or weakening incentives to reduce tailpipe emissions.	Increases or prolongs demand for ETS2 allowances and raise the ETS2 carbon price.	Reduces consumers' ability to avoid ETS2-related fuel cost increases, particularly where the availability of zero-emission or low-emission alternatives is delayed.
Mixed / unclear impact on consumer exposure to ETS2 cost impacts	Policy elements whose effect on fossil fuel demand depends on implementation, market response, and real-world use. These elements may either accelerate or delay zero-emission vehicle uptake, and may reduce, increase or prolong fossil fuel demand	Could reduce, increase or prolong ETS2 allowance demand. The effect on the ETS2 carbon price is therefore uncertain and context-dependent.	May either improve or reduce consumers' ability to avoid ETS2-related costs. The consumer impact depends on whether the element delivers real-world fossil fuel displacement, expands affordable alternatives, or instead prolongs reliance on fossil fuels.
Limited / negligible impact on consumer exposure to ETS2 cost impacts	Policy elements with very limited or negligible effects on fleet composition, vehicle use, or fossil fuel demand.	Limited or negligible effect on ETS2 allowance demand and carbon price pressure.	No significant direct effect on consumers' exposure to ETS2-related costs. Any consumer impact is likely to be indirect, marginal or confined to specific market segments.

4.3 Assessment of initiatives – Interaction with ETS2

4.3.1 Proposed amendments to CO_2 emission standards for LDVs

Background to the Regulation

Regulation (EU) 2019/631, amended by Regulation (EU) 2023/851, sets CO_2 emission performance standards for new light-duty vehicles (LDVs) in the EU, with the aim to reduce emissions from new LDVs placed on the EU market. The regulation requires progressive CO2 emission reductions for new passenger cars and light commercial vehicles, by setting **binding CO_2 emission targets for manufacturers**. The 2023 amendment strengthened the targets and currently establishes:

- **For 2030:** a 55% CO_2 emission reduction for new passenger cars and a 50% reduction for new vans, compared to 2021 levels.
- **From 2035 onwards:** a 100% CO_2 emission reduction target for both new cars and vans, meaning that all new cars and vans placed on the EU market from 2035 would need to have zero tailpipe CO_2 emissions (European Commission, 2023).

By setting progressively stricter CO_2 targets, the regulation gives the automotive sector a clear pathway to support the EU's climate objectives, while providing manufacturers and investors with a long-term market signal by creating predictability for investment. It also addresses the risk that the transition to electric mobility is delayed by market failures or uneven incentives, such as manufacturers postponing investment in zero-emission technologies (European Parliament, 2026).

Under this regulation, manufacturers must meet fleet-average CO_2 targets across all new vehicles registered in the EU. Every year, a specific emission target is calculated for each manufacturer based on the EU fleet-wide target applicable for that year and the characteristics of the new vehicle fleet; if this value is surpassed, excess emission premiums are imposed to manufacturers based on gCO_2/km (European Commission, 2023).

Following sustained pressure from industry stakeholders, who highlighted gaps between the regulatory trajectory and market realities (ACEA, 2025) (T&E, 2025), the European Commission presented a proposal to introduce additional flexibility into this framework in 2025. The key concern identified by the Commission was that the existing regulation could risk European competitiveness by limiting the range of technologies available to manufacturers, leading to a stronger focus on a more technology-neutral approach. As part of the Automotive Package, the Commission proposed a revision of the CO_2 standards for cars and vans. The main elements of the proposed amendments, relevant to the interaction of this regulation with ETS2, are described below (European Commission, 2025):

- **Lower binding CO_2 emission targets:** the proposal reduced the 2035 target from a 100% tailpipe emissions reduction to a 90% reduction, with the remaining 10% addressed through compensation mechanisms. This allows plug-in hybrids, mild hybrids and some internal combustion engine vehicles to continue playing a role beyond 2035, alongside fully electric and hydrogen vehicles.
- **Compensation mechanisms:** manufacturers can compensate the remaining 10% emissions reduction through greenhouse gas savings associated with:
    - the production of vehicles that use alternative fuels (such as e-fuels, biofuels, renewable fuels of non-biological origin, etc.), allowing them to claim **fuel credits** (to account for 3% of this compensation) the use of low-carbon steel made in the EU in the vehicles produced, allowing them to claim **low carbon steel credits** (to account for 7% of this compensation).
- **Banking and borrowing mechanism:** allows manufacturers to exceed their target in one year if it is compensated by overachievement in another year within the period between 2030 to 2032, allowing compliance of the targets to be assessed over a three-year average rather than annually.
- **Super credits for small affordable zero-emission vehicles:** until 2034, each qualifying small electric car made in the EU will count as 1.3 vehicles when calculating a manufacturer's average specific emissions. This measure is intended to incentivise the production of smaller and more affordable electric vehicles, helping increase the availability of lower-cost models.

Lastly, the framework continues to keep the following elements already in place:

- **Excess emission premiums:** to penalise manufacturers that fail to meet their specific emission targets, these premiums are imposed for each gram of CO_2/km exceedance and per vehicle registered. This mechanism has been in place since the original regulation in 2009, which set the premium at EUR95 per gCO_2/km. The same penalty level continues to apply unchanged under Regulation (EU) 2023/851 (ICCT, 2023).
- **Eco-innovations:** rewards manufacturers for introducing alternative technologies that reduce CO_2 emissions but are not fully captured during standard type-approval testing, only applied to vehicles that have internal combustion engines. In this way, eco-innovations are intended to support additional emissions reductions within the fleet.
- **Pooling:** manufacturers can group to meet their targets collectively, as long as they comply with EU competition rules.
- **Derogations for small-volume and niche manufacturers:** allow certain manufacturers with limited production volumes to follow specific compliance arrangements rather than the standard fleet-wide targets, reflecting their different capacity to adapt their product portfolio while still taking part in the overall transition to electric mobility.

Assessment

Different elements of the CO_2 standards amendments are expected to have varying effects on fleet composition and fossil fuel demand, leading to a range of interactions with ETS2 implementation. These interactions are summarised in Table 4-2 and described in further detail in the subsequent section.

Table 4-2: Proposed amendments to CO_2 standards for LDVs – Expected interactions with ETS2

Element / modality	Type of interaction with ETS2
Lower 2035 CO_2 target (90% instead of 100%) Alternative fuel compensation mechanism (fuel credits) Super credits for small affordable zero-emission vehicles	Mixed / unclear impact on consumer exposure to ETS2 cost impacts
Banking and borrowing mechanism Pooling arrangements	Increases consumer exposure to ETS2 cost impacts (-)
Excess emission premiums	Reduces consumer exposure to ETS2 cost impacts (+)
Low-carbon steel compensation mechanism Eco-innovation credits Derogations for small-volume and niche manufacturers	Limited / negligible impact on consumer exposure to ETS2 cost impacts

Lower binding CO_2 emission targets and alternative fuel compensation mechanism (fuel credits)

The reduction of the 2035 target from 100% (current baseline) to 90% for cars, combined with the alternative fuel compensation mechanism (fuel credits) designed to cover 3% of the remaining 10% gap, is expected to have a mixed or uncertain impact on consumer exposure to ETS2 cost impacts. The mechanism could, in principle, offset part of the additional emissions arising from a less ambitious CO_2 target, but in practice several factors limit its capacity to deliver meaningful ETS2 cost relief for consumers.

On the one hand, the use of e-fuels and biofuels as an alternative to compensate for 3% of total CO_2 emissions could, in principle, partially offset the ETS2 impact of lowering the 2035 CO_2 target from 100% to 90%. Alternative fuels that meet the sustainability and GHG savings criteria under the Renewable Energy Directive (RED III) can be zero-rated under the EU ETS monitoring and reporting framework, meaning that fuel suppliers would not need to surrender ETS2 allowances for the eligible share of the blend. In this sense, a larger share of RED III-compliant renewable fuels in the mix would directly reduce the ETS2 cost embedded in the fuel price faced by consumers.

In addition, e-fuels and biofuels could expand the availability of low-carbon options for drivers with a drop-in solution that favours those with insufficient access to charging infrastructure or cannot afford to buy an EV (AECC, 2025).

On the other hand, the extent to which the lower target coupled with fuel credits translates into a real reduction in consumer exposure to ETS2 costs is highly uncertain, for the following reasons:

- **Prolonged presence of ICE and hybrid vehicles in the fleet.** These measures prolong the presence of internal combustion engine (ICE) vehicles, plug-in hybrids (PHEVs) and mild hybrids in the market, delaying ZEV uptake, and fossil fuel demand can be sustained for longer if there are no effective safeguards to ensure that these vehicles cannot operate on fossil fuels (ICCT, 2023). Furthermore, the emissions performance of plug-in hybrid vehicles (PHEVs) depends strongly on how frequently drivers use the electric powertrain rather than the combustion engine. While laboratory assumptions have often reflected a relatively high share of electric driving, evidence shows that real-world emissions from PHEVs can be three to five times higher than laboratory values, largely because combustion-engine use is more frequent than expected (ECA, 2024). As a result, if plug-in hybrids remain in the fleet for longer but are primarily used as ICE vehicles, they may not deliver the expected reduction in fuel consumption and emissions.
- **Limited scale of the mechanism.** Even if some additional volumes were incentivised, e-fuels and biofuels are widely assessed as having a limited role in overall emissions reductions (FIA Region I, 2026), and their effectiveness in reducing ETS2 exposure is conditional on strict compliance with RED III sustainability and GHG savings criteria.
- **Overlap with RED III obligations.** RED III already mandates progressively higher shares of renewable energy and advanced biofuels/RFNBOs in the transport fuel mix and creates strong economic incentives — via ETS2 zero-rating and the credit mechanism for renewable electricity — for suppliers to deliver these volumes. As a result, a significant share of the alternative fuels rewarded under the CO_2 standards' fuel credits mechanism is likely to come to the market regardless of the credits, driven by the RED III framework. In practice, this means that the 3% compensation could be largely achieved through volumes that would have entered the market anyway, effectively acting as a "free" compliance mechanism for car manufacturers rather than delivering additional fuel decarbonisation. Under this interpretation, the fuel credits would not generate any material additional reduction in ETS2 allowance demand beyond what RED III already delivers.

If these dynamics materialise, they would lead to increasing demand for ETS2 allowances and higher carbon and fuel prices for consumers. An assessment by T&E finds that the proposed reduction would lead to additional emissions of up to 720 Mt CO_2eq between 2025 and 2050, 10% more than under the current regulatory scenario, and would enable manufacturers to postpone their CO_2 reduction efforts (T&E, 2025). The Commission's impact assessment also points to a related effect on energy demand, as lower ZEV uptake could reduce electricity demand when compared with the current regulatory baseline. However, this decrease would likely be offset by higher demand for liquid fuels, as vehicles relying on combustion-based powertrains are less energy-efficient than electric equivalents (European Commission, 2025).

Low-carbon steel compensation mechanism

Incorporating low-carbon steel made in the EU into vehicle manufacturing, as a compensation mechanism for the remaining 7% of CO_2 emissions, would address emissions linked to vehicle materials rather than improving efficiency or emissions performance of the vehicle technology itself, and would not directly reduce fuel consumption or ETS2 exposure during the vehicle use phase.

Other flexibilities

Additional measures included in the amendments, such as banking and borrowing or pooling, both of which are meant to reduce the compliance burden on manufacturers, are also expected to increase consumer exposure to ETS2-derived costs. Stakeholders warn that these amendments are likely to further delay the large-scale development of ZEVs, with T&E analysis suggesting that BEV sales would fall to 47% in 2030 instead of the expected 57% if the 2030 target is averaged over a three-year period (BEUC, 2026) (T&E, 2025). Again, delaying the shift in fleet composition would increase pressure on fuel demand and ETS2 allowances, resulting in greater cost exposure for consumers who will not see the availability of low-emission alternatives increased.

Similarly, current derogations for low-volume manufacturers are not intended to reduce CO_2 emissions (ECA, 2024). However, since these derogations target a small market segment, its impact is negligible.

Excess emission premiums

Imposing excess emission premiums for manufacturers that do not achieve the targets as set out in the Regulation is likely to have a different type of interaction with ETS2. In this case, the measure can provide an incentive for manufacturers to comply with their CO_2 targets and increase ZEV production, promoting EV uptake and reduced

fossil fuel demand, which would in turn contribute to decrease ETS2 allowance demand and therefore carbon price pressure. Consequently, fuel prices for consumers could be lower than under a weaker compliance framework, contributing to lower overall mobility cost pressure and expanding the availability of low-carbon options, as zero-emission vehicles become increasingly present in the fleet.

At the same time, the scale of this effect remains uncertain. The premium has remained unchanged at EUR95 per gCO_2/km since the 2009 regulation, meaning that the same penalty level will apply for several decades without adjustment until the 2035 deadline (ICCT, 2023). Similarly, the Commission's impact assessment, despite framing the risk of fines as a relevant element, does not quantify the likelihood of non-compliance or the associated level of excess emissions premiums under baseline conditions, making it difficult to precisely assess the real impact of this mechanism (European Parliament, 2026).

Super credits for small affordable zero-emission vehicles

The interaction between ETS2 and super-credits for small and affordable electric vehicles is less clear, as it is likely to have a mixed impact on consumer exposure to ETS2 costs. The aim of this mechanism is to expand the availability of more affordable zero-emission vehicles, which is highly welcomed by relevant stakeholders who indicate that the lack of accessible options remains a major barrier for many consumers, and point out that hybrids are often not a realistic alternative for many households because they tend to be too expensive and poorly suited to the second-hand market (BEUC, 2025) (FIA Region I, 2026). In this regard, favouring small EV uptake could allow consumers to benefit from a wider range of affordable options and lower mobility costs as a result of reduced fossil fuel demand – however, research from T&E shows that the super-credit approach would allow manufacturers to sell fewer electric vehicles while still meeting their regulatory targets, leading to the opposite effect than initially expected (T&E, 2025). As a result, the interaction between this element and ETS2 remains uncertain, as it could have mixed effects on fleet composition, fuel demand, and therefore carbon and fuel prices.

Eco-innovations

Eco-innovations have the potential to lower CO_2 emissions of ICE vehicles, although research shows that their proven effect has so far been limited – on average they reduced emissions by only 1 g CO_2/km in 2020, which represents less than 1% of the average vehicle emissions that year. Average real-world emissions from ICE vehicles have not decreased, as the introduction of hybrid powertrains and improvements in engine efficiency have been outweighed by increased vehicle mass and more powerful engines (ECA, 2024). Therefore, eco-innovation credits can reduce the manufacturer's fleet-average CO_2 emissions without translating into increased availability of zero-emission vehicles or meaningful reductions in fuel consumption. Again, delaying ZEV uptake would have a direct impact on fossil fuel demand, meaning that pressure on ETS2 allowance demand, carbon prices and fuel prices may remain. As a result, the effect on consumers is expected to be limited, with only a small potential reduction in exposure to ETS2-related costs.

Distributional impacts of ETS2 interaction

Because the amendments operate primarily through fleet composition and fuel supply, any resulting increase in fossil fuel demand and ETS2 allowance demand would translate into higher ETS2 carbon prices and higher fuel prices for all consumers of ETS2-covered fuels. In this sense, any interaction with ETS2 (positive or negative) is expected to be broadly distributed across all fossil-fuel vehicle drivers. If negative, it could be expected that the burden would fall more disproportionately on consumer segments less able to afford ZEVs, such as lower-income households, second-hand vehicle buyers not able to afford a new EV, rural users and SMEs.

4.3.2 Proposed corporate fleets initiative (LDVs)

Background to the proposed regulation

The EC's proposal for a Regulation on Clean Corporate Vehicles (CCVR) was presented in December 2025 as part of the EU Automotive Package to support the sector's transition to clean mobility. The CCVR proposal sets out mandatory national targets for the minimum share of zero- and low-emission vehicles in new corporate fleet registrations, beginning in 2030.

Corporate vehicles currently account for approximately 60% of new car registrations and 90% of new van registrations across the EU with on average double the yearly mileage than privately owned cars and typically re-enter the market after 3 to 5 years (International Road Transport Union, 2026). Large corporations have an especially disproportionate impact; despite comprising only 0.16% of all EU companies, they are responsible for an estimated 37% of new car registrations (T&E, 2026). Thus, targeting large corporate fleets represents an opportunity for significant emissions reduction within the automotive sector.

In its current form, the CCVR would only apply to large undertakings, defined as companies which meet at least two of the following three criteria: a balance sheet total of €25 million, net turnover of €50 million, and more than 250 employees.

The CCVR requires:

- A **minimum share of newly registered company cars to be zero- and low-emission**, with specific targets for zero-emission vehicles, and varying targets for each member state based on their GDP per capita. These targets would be implemented at the national level, thus allowing adaptability to the unique situation of each Member State.
- Member States to only provide **financial support** to corporations for the purchase or renting of vehicles if said vehicles are zero- or low-emission and made in the European Union.

Currently, Member States provide over €40 billion to the corporate car market, with much of this funding supporting traditional ICE vehicles (Eurelectric, 2025). Thus, by restricting eligibility for financial assistance to low- and zero-emission vehicles made in the EU, the CCVR has potential to rapidly green corporate fleets. These measures also intend to create a clear demand-side signal for European car manufacturers, who have cited insufficient demand as a barrier to scaling up zero-emission vehicle sales (T&E, 2026). Moreover, with the rapid resale of corporate vehicles compared to those privately owned, the proposed Regulation has the potential to accelerate the supply of zero- and low-emission vehicles to the second-hand market, which is the go-to market for the majority of European consumers (BEUC, 2025).

Assessment

Table 4-3 summarises the expected interactions between the proposed CCVR and ETS2:

Table 4-3: Proposed Regulation on Clean Corporate Vehicles – Expected interactions with ETS2

Element / modality	Type of interaction with ETS2
Minimum share of ZEVs/LEVs in corporate fleets Financial support to corporations limited to the purchase and renting of ZEVs/LEVs made in the EU	Reduces consumer exposure to ETS2 cost impacts (+)

The targets for increased shares of ZEVs/LEVs in corporate fleets, coupled with financial assistance, strengthens incentives for electrification and are expected to have a directly positive impact on ZEV uptake within corporate fleets. The European Commission estimates that the regulation could bring approximately 995,000 additional zero-emission cars in 2029 and 865,000 in 2030, and around 117,000 additional zero-emission vans in 2029 and 104,000 in 2030 (European Commission, 2025). This would directly reduce fossil fuel demand, and, in turn, ease carbon price pressure imposed by ETS2, **reducing consumer exposure to ETS2 cost impacts (+).**

This positive effect could be further potentiated by the increased availability of second-hand ZEVs entering the market. A faster increase in ZEVs within corporate fleets, especially those with rapid turnover like rental cars, is likely to further stimulate the availability of ZEVs in the second-hand market, making them more widely available and affordable for citizens and Small and Medium-sized Enterprises (SMEs). The European Commission estimates that, as a result of this regulation, between 595,000 and 1.2 million cars and between 104,500 and 193,000 vans could enter the second-hand market per year in 2031-2050 (European Commission, 2025). The greater the volume of affordable second-hand ZEVs available, the stronger the downstream effect on reducing consumer exposure to ETS2, as more households and SMEs would be able to transition away from fossil-fuel vehicles. Furthermore, citizens who lease or rent vehicles from these corporations would also have improved access to ZEVs (European Commission, 2025).

One key critique of this proposed regulation is that it relies on a highly restrictive definition of zero- and low-emission vehicles. By excluding other vehicle technologies which could also produce emissions reductions, the regulation risks slowing corporate uptake of low- and zero-emissions vehicles (International Road Transport Union, 2026). Similarly, uncertainty around the definition of “made in the European Union” vehicles limit the ability to predict consumer impacts (International Road Transport Union, 2026).

Distributional impacts of ETS2 interaction

The reduction in ETS2 cost exposure generated by the CCVR is expected to be broadly distributed across all consumers of ETS2-covered fuels, as lower fossil fuel demand from corporate fleets translates into reduced allowance demand and downward pressure on the ETS2 carbon price. While the benefit accrues to all fossil-fuel vehicle drivers, its relative impact is likely to be greater for lower-income households, who spend a higher share of income on fuel and are least able to transition away from ICE vehicles in the short term. In this sense, the CCVR's ETS2-related benefits, though not explicitly targeted, could have a mildly progressive distributional effect.

4.3.3 Proposed amendments to the Car labelling Directive

Background to the regulation

The Car Labelling Directive (Directive 1999/94/EC) requires EU countries to ensure that relevant information on a car's fuel efficiency and CO_2 emissions is provided to consumers at the point of purchase or lease of a new car, with the aim of supporting consumers in buying or leasing cars which use less fuel and thereby emit less CO_2. The Directive requires:

- A **label** showing fuel economy and CO_2 emissions on all new cars or displayed nearby at the point of sale;
- A **poster or display** prominently showing the official fuel consumption and CO_2 emissions data of all new car models displayed or offered for sale or lease at point of sale;
- A yearly **guide** on fuel economy and CO_2 emissions from new cars, available free of charge at the point of sale;
- All **promotional literature** to contain the official fuel consumption and CO_2 emissions data for the car models to which it refers.

As a demand-side policy, this directive is a complementary measure to help car manufacturers meet their specific CO_2 emission targets set under Regulation (EU) 2019/631.

The European Commission has identified shortcomings in the current labelling framework, noting that the 1999 Directive is limited in coverage (i.e. applicable to new cars only), leaving consumers without similar fuel efficiency and CO_2 emission information when buying new vans or second-hand vehicles. It also does not provide adequate information on zero-emission vehicles (i.e. range). In addition, information does not have to be provided in digital format and comes in forms that are not harmonised at the EU level (European Commission, 2025).

Due to its Directive status, there is also flexibility in the way in which it has been transposed in EU Member States, resulting in a lack of harmonisation in the labels across Member States, including significant variation in colour codes, label formats, parameters, metrics, and information requirements, limiting consumers' ability to compare models easily (BEUC, 2025) (Transport & Environment, 2026). These limitations restrict informed purchase decisions, limit demand for zero-emission vehicles and risk slowing the shift to zero-emission mobility. (European Commission, 2025). As consumers increasingly rely on online tools to research the market and compare vehicles, the absence of mandatory and harmonised labels on online platforms makes it more difficult to identify the most fuel- or electricity-efficient options (BEUC, 2025). Overall, these limitations restrict informed purchase decisions, limit demand for zero-emission and more energy-efficient vehicles, and risk slowing the shift to zero-emission mobility (European Commission, 2025).

In December 2025, the Automotive Package included a proposal for a review of the Car Labelling Directive, as part of the proposed revision of Regulation (EU) 2019/631 setting CO_2 standards for cars and vans. This proposal contains the following proposed main changes compared to the current Directive:

- **Extending the scope** from currently new cars only, to include also new vans and second-hand cars and vans;
- **Harmonising the design of the vehicle label across all Member States**, based on the design of the well-known energy labels;
- Adding to the vehicle label specific **information elements that are relevant for potential buyers of zero-emission (and plug-in hybrid electric) vehicles**, that is the electric energy consumption and the electric range; for used EVs, information on a vehicle's battery state of health (SoH).
- Allowing consumers to compare different vehicle models, including from different manufacturers, by making additional information on vehicle models available in a **product database**; while removing the obligation for a poster and guide on paper.

Assessment

The Car Labelling Directive and its proposed amendments do not directly influence vehicle supply, fuel use, fuel prices or emissions. They will not directly reduce fossil fuel use or ETS2 allowance demand. Instead, it will act upstream of ETS2 by improving the information available to consumers at the point of vehicle purchase, and potentially through online comparison tools, informing consumer's purchasing behaviour. Table 4-4 summarises the expected interactions between the proposed CCVR and ETS2:

Table 4-4: Proposed amendments to Car Labelling Directive – Expected interactions with ETS2

Element / modality	Type of interaction with ETS2
Inclusion of new information elements for ZEVs, PHEVs and used EVs Extension of scope to new vans and second-hand cars and vans Harmonised EU vehicle label design based on the energy label model Online product database enabling comparison across vehicle models and manufacturers	Enable lower consumer exposure to ETS2 cost impacts (+)

If improved, harmonised and more easily accessible information positively impacts consumer's purchasing behaviour (i.e. selection of ZEVs or more energy-efficient vehicles), it could gradually reduce fossil fuel use, lower demand for ETS2 allowances and ease carbon price pressure. Therefore, it could have an **indirect positive interaction with ETS2, indirectly supporting lower consumer exposure to ETS2 cost impacts**, depending on the extent to which improved consumer information leads to actual changes in purchasing behaviour.

The proposed amendments are expected to have an indirect impact on fleet composition. By improving the quality, comparability, consistency and visibility of information on vehicle CO_2 emissions, energy performance and electric vehicle range, the revised Directive could:

- Boost visibility of low- and zero-emission vehicles of by improving the quality and accessibility of customer-facing information;
- help consumers make more informed purchase decisions, support comparisons between vehicle technologies, and encourage them to select more energy-efficient vehicles, improving overall affordability and their ability to avoid future ETS2-related fuel costs;
- increase confidence in zero-emission vehicles through the provision of more detailed and accurate information about their performance, thereby supporting their uptake over time;
- incentivise carmakers to invest in ZEV production as a result of increased consumer confidence in, and demand for, ZEVs (E-Mobility Europe, 2025).

All these aspects, in turn, can contribute to improving overall mobility affordability and consumers' ability to avoid future ETS2-related fuel costs.

Scope extension

The potential extension of the scope of the label to new vans, as well as second-hand cars and vans, has received support from diverse stakeholders in the automotive and environmental sectors. The Commission's Open Public Consultation found that a majority of stakeholders considered it important to extend the labelling requirement to new vans, while around half supported extending the requirements to second-hand cars and vans sold through dealerships (European Commission, 2025). The scope extension has been shown to have great potential for supporting lower consumer exposure to ETS2 cost impacts, as it will increase the number of consumers reached by vehicle information requirements. This is relevant for the user vehicle segment, as a large share of consumers purchase vehicles in the second-hand market (Transport & Environment, 2026) (BEUC, 2025), as well as for the van segment, as these vehicles typically have higher mileage compared to cars, increasing their exposure to ETS2-related fuel costs. The measure would therefore help ensure that not only individual consumers, but also small businesses and commercial users are better informed.

According to the Commission's impact assessment, extending labelling requirements to all second-hand cars and vans sold by professional retailers, including vehicles registered before the new legislation enters into force, could reach an additional 145 million second-hand vehicle buyers over the period from 2029 to 2040 (European Commission, 2025). Distributors of used vehicles would be required to provide information on battery state of health, which is an important missing piece for the development of a dynamic and functional used EV market (Transport & Environment, 2026).

Nevertheless, the effectiveness of the label will depend on its design and the credibility of the information included. Stakeholders stress the need for clear, accurate, meaningful, standardised and user-friendly information, allowing consumers to compare models easily without adding unnecessary complexity (FIA Region I, 2026) (E-Mobility Europe, 2025).

Online product database

The proposal for an online product database responds to increasingly digital vehicle researching and purchasing, enabling consumers to compare different vehicle models more easily by centralising information in a single platform, making information more accessible beyond the point of sale, and reaching a higher number of consumers. By providing consumers with more detailed information to meet their specific needs, it can allow users to identify vehicles with lower fuel or energy consumption, lower running costs, and lower exposure to ETS2 cost impacts. Public consultation results also showed a high level of support for this measure (European Commission, 2025).

Design harmonisation

The proposed harmonisation of the label design based on the well-established design of EU energy labels has also been very welcomed by different stakeholders (BEUC, 2025) (Transport & Environment, 2026) (European Commission, 2025). Harmonisation is expected to strengthen the effectiveness of the interaction of the Car Label with ETS2 by:

- simplifying the information and making it more understandable for potential buyers and more easily comparable between different vehicles (European Commission, 2025);
- leveraging the familiarity with the EU energy label already used across Member States;
- ensuring a consistent approach across the EU, and avoid confusion resulting from different rating systems across Member States;
- supporting public authorities in the establishment of incentive mechanisms based on harmonised labels (E-Mobility Europe, 2025)

New information elements

Potentially including new/additional information in the label is also relevant in terms of its interaction with ETS2 and has potential for positive impact. Moreover, the 2025 public consultation results also showed strong support for including information on real-world fuel or energy consumption, which was ranked as the most important additional information element to include (European Commission, 2025). An argument behind this is that official laboratory values do not reflect real-world fuel consumption and emissions, particularly for plug-in hybrids (Transport & Environment, 2026) (BEUC, 2025). Despite this, the current Commission proposal does not include real-world data on emissions as an information element, meaning that labels could understate actual fuel use and limit consumers' ability to understand actual running costs, therefore, increasing future exposure to ETS2-related costs. At the same time, including a lot of information can lead to information overload, and consumers may not clearly understand the distinction between official type-approval values and real-world values, potentially limiting the extent to which the inclusion of additional metrics improves the clarity or usefulness of the label.

Distributional impacts of ETS2 interaction

The distributional impact of the proposed revision of the Car Labelling Directive and its interaction with ETS2 is likely to be broadly positive. The ETS2-related benefits of the revised Car Labelling Directive are expected to accrue broadly across the full spectrum of vehicle users, but it is worth making a distinction:

- Direct beneficiaries will be those who gain access to improved, harmonised and more comparable vehicle information at the point of purchase, namely, buyers of new and second-hand cars and vans, and will be better equipped to identify vehicles with lower fuel or energy consumption and lower future exposure to ETS2-related fuel costs.
- Indirect beneficiaries will be all consumers of ETS2-covered fuels, to the extent that improved information shifts purchasing behaviour toward more energy-efficient and zero-emission vehicles, the resulting reduction

in fossil fuel demand would translate into lower ETS2 allowance demand and, ultimately, downward pressure on the ETS2 carbon price faced by all remaining fossil-fuel users.

Extending the label to second-hand vehicles and vans is particularly relevant from a distributional perspective, as it can benefit cost sensitive consumers unable to purchase new vehicles and are more dependent on the used vehicle market, as well as small businesses and commercial users who typically face higher fuel exposure due to higher mileage. By improving the quality and comparability of information available to these consumers, the revised Directive could support more informed purchasing decisions in the market segments most exposed to ETS2 costs, generating a mildly progressive distributional effect. However, the magnitude of these benefits will depend on:

- the credibility, clarity and user-friendliness of the redesigned label
- whether clearer and harmonised information is accompanied by the actual availability of affordable ZEVs
- the extent to which improved information translates into actual changes in purchasing behaviour

4.3.4 Upcoming review of the Alternative Fuels Infrastructure Regulation (AFIR)

Background to the regulation

The Alternative Fuels Infrastructure Regulation (AFIR) (Regulation (EU) 2023/1804) came into force in April 2024 as part of the 'Fit for 55' legislative package to reduce greenhouse gas emissions 55 percent by 2030. This regulation replaced the previous Directive 2014/94/EU (AFID), which established a framework for the deployment of alternative fuels infrastructure across the EU. Unlike the prior Directive, AFIR sets **mandatory national targets** for the deployment of infrastructure for road vehicles, maritime vessels, and stationary aircraft.

The AFIR aims to ensure accessibility, user-friendliness, and interoperability of charging infrastructure across the European Union. The main obligations pertaining to light duty vehicles (LDVs) include (relating to passenger road transport):

- **Mandatory national fleet-based targets for publicly accessible charging:** Member States must provide, through publicly accessible recharging stations, a minimum amount of charging capacity relative to the size of the electric vehicle fleet, corresponding to at least 1.3 kW per battery electric LDV and 0.8 kW per plug-in hybrid LDV.
- **Distance-based targets for charging infrastructure along the TEN-T network:** Member States are required to deploy fast-charging infrastructure at regular intervals along major transport corridors. This includes the provision of charging pools with a minimum total capacity (e.g. at least 400–600 kW) every 60 km on the TEN-T core network, ensuring sufficient availability of high-power charging.
- Provisions for **pricing, user-friendliness and interoperability**, including:
    - **Ad hoc access and payments:** Operators of publicly accessible recharging points must enable end users to recharge their EVs on an ad hoc basis, without requiring a pre-existing contract. All EV charging stations with over 50 kW must accept card payments.
    - **Pricing:** Charging prices should be reasonable, easily and clearly comparable, transparent and non-discriminatory (among end users and mobility service providers). CPOs may differentiated price only if the differentiation is proportionate and objectively justified. Pricing information should be available at the station (for all charging stations over 50 kW).

AFIR aims to address insufficient availability and accessibility, as well as uneven distribution, of electric recharging points for LDVs. Multiple stakeholders in the transport and electric sectors affirm that it has contributed to increased deployment of public charging stations available for users (Eurelectric, 2026) (BEUC, 2026) and in aligning infrastructure deployment with EV uptake (ChargeUp Europe, 2026) (Shell, 2026). However, stakeholders also highlight that:

- EV users are still constrained by limited and uneven coverage, with 50kW charging stations still common in some routes (BEUC, 2026)
- Uneven distribution of charging infrastructure persists across Member States, TEN-T corridors, and rural areas (FIA Region I, 2026)
- Charge point implementation targets do not match the current reality of road usage patterns and functional geography of logistics and passenger mobility, and do not account for expected demand outside of the main TEN-T corridors (International Road Transport Union, 2026)

- Charging pricing is volatile, varies between locations, and lacks transparency; current regulation lacks specific metrics to ensure consistency and comparability of prices (BEUC, 2026) (Hubject GmbH, 2026).
- The absence of interpretive guidance over what counts as proportionate and justified pricing differentiation creates legal and commercial uncertainty (Platform for Electromobility, 2025b)

Acknowledging these challenges, the European Commission is currently undertaking a review of AFIR. The Open Public Consultation (OPC) (which followed a previous Call for Evidence) on AFIR's review, launched on 11 May[36], to aim to gather stakeholder views on the potential evolution of the AFIR framework.

For light-duty vehicles, the consultation identifies shortcomings in the rollout of recharging infrastructure, particularly in terms of uneven spatial coverage and the limited granularity of existing targets. To address these challenges, a set of potential policy measures is explored, including:

- Adjustments to recharging infrastructure targets, including:
  - Increasing fleet-based power output targets for publicly accessible recharging infrastructure, as well as power output targets along the TEN-T network.
  - Introducing greater flexibility in the design of targets for LDV recharging pools along the TEN-T network, to better reflect actual demand across different segments.
- Introduction of regional sub-targets, aimed at ensuring minimum coverage and greater territorial coherence in the deployment of recharging infrastructure across EU regions.
  - Measures to improve user experience, including:
  - Enhancing price transparency (e.g. requiring ad hoc prices to be displayed at recharging stations).
  - Expanding access to simple payment methods (e.g. card payments at all stations).
  - Improving accessibility for users with disabilities.
- Measures related to market functioning and pricing, including:
  - Improving competition through fair tendering and concession practices.
  - Monitoring and possibly regulating price-setting practices of operators and mobility service providers.
  - Exploring mechanisms to better align charging prices with electricity market conditions.

All these changes are currently under consultation; there are currently no indications as to which of the aforementioned amendments (if any) will be adopted.

Assessment

The proposed amendments to AFIR intend to ensure coherent and sufficient infrastructure and a transparent, user-friendly experience at charge points. Proposed changes involving **increased and more flexible charging targets, the setting of regional sub-targets, improved user experience, and fair tender and concession practices** have potential to indirectly enable the uptake of ZEVs as a consequence of improved charging infrastructure and user experience, thereby **indirectly supporting lower consumer exposure to ETS2 cost impacts.** The proposals regarding **price-intervention**, however, could have **mixed effects on consumer exposure to ETS2 cost impacts** depending on which elements are implemented and how. Table 4-5 summarises the expected interactions between the proposed AFIR amendments and ETS2:

Table 4-5: Proposed amendments to Alternative Fuels Infrastructure Regulation – Expected interactions with ETS2

Element / modality	Type of interaction with ETS2
Adjustments to recharging infrastructure targets Setting of regional sub-targets User experiences measures Fair tender and concession practices	Enable lower consumer exposure to ETS2 cost impacts (+)

[36] Available at AFIR review: shaping Europe's alternative fuels network | European Alternative Fuels Observatory

Element / modality	Type of interaction with ETS2
Measures to reduce flexible pricing models of charge point operators and mobility service providers	Mixed/unclear impact on consumer exposure to ETS2 cost impacts (+/-)

Adjustments to recharging infrastructure targets, setting of regional sub-targets, and user experience measures

Although the adjustments to recharging infrastructure targets and the setting of regional sub-targets, and the measures intended to improve the user experience do not directly incentivise the purchase of zero-emission vehicles, they interact with ETS2 indirectly by removing key barriers to ZEV adoption by:

- Increasing volume, power, and geographic distribution of recharging facilities, which could reduce "range anxiety" among consumers, making long-range ZEV trips more feasible
- Enabling a more demand-responsive infrastructure rollout, ensuring sufficient charging infrastructure in places it is most needed
- Preventing "charging deserts" via regional sub-targets, which ensure all regions have a minimum amount of charging infrastructure
- Providing a more user-friendly recharging experience via the diversification of payment options
- Increasing accessibility of charging stations for consumers with disabilities
- Increasing consumer trust in Mobility Service Providers (MSPs) and charge point operators (CPOs) via real-time, transparent pricing (Eurelectric, 2026)
- Reducing friction points for consumers (Eurelectric, 2026)

Furthermore, the creation of regional sub-targets for charging infrastructure could promote a more balanced geographic rollout that reflects actual traffic patterns, rather than simply increasing the total number of charge points across the EU. From an ETS2 perspective, this is significant because it would help ensure that the option to switch away from ETS2-covered fuels is available across all regions, rather than being concentrated in areas that are already well served.

One potential design risk of these proposed changes is the potential under-utilisation of charging infrastructure, driven by possible overbuilding to meet higher capacity targets (Shell, 2026). Reduced charging prices require increased utilisation of charging infrastructure; thus, usage-related metrics could act as a better indicator of future charge prices than capacity targets alone (Electra, 2026). In addition, higher charging capacity targets could lead to greater dependence on raw materials and higher implementation costs, which may be passed onto the consumer (Trusted Charging Alliance, 2026). From an ETS2 interaction standpoint, both of these design risks could weaken the expected positive effect: if they translate into higher charging prices, they could discourage LZEV adoption by consumers, slowing the shift away from ETS2-covered fuels and dampening the anticipated reduction in consumer exposure to ETS2 costs. Regarding the proposed changes to increase flexibility of infrastructure targets, the IRU posits that the concept of "traffic density" must be explicitly defined at the EU level to reflect true operational road usage (IRU, 2026).

Regarding the measures to increase price transparency, the proposed changes do not address the need for better pricing information across diverse channels. The inclusion of such information in mobile apps, charger screens, and in-vehicle systems would empower consumer awareness and choice (Hubject GmbH, 2026). Without expanding price transparency measures to these channels, consumers may still receive limited or fragmented information on charging prices, limiting the extent to which improved user experience translates into faster ZEV uptake and, therefore, into reduced consumer exposure to ETS2 cost impacts.

Measures to ensure fair tender and concession practices

Public charging markets are prone to concentration, which weakens the price competition that makes switching away from ETS2-covered fuels attractive. In many local markets a single charge point operator (CPO) holds significant power through exclusive concessions or long-term contracts, limiting new entrants and potentially leading to higher prices and reduced consumer choice. Furthermore, early entrants can further consolidate their position by benefiting disproportionately from network effects and economies of density, while exclusive contracts and vertical integration between CPOs or eMSPs and upstream stakeholders (such as Distribution Network Operators) can restrict site access for rival providers and prioritise partner organisations. These dynamics risk exclusionary conduct that limits site access, innovation and investment efficiency (FIA , 2025).

Against this backdrop, fairer tender and concession processes could encourage a broader range of CPOs to enter the market and increase competition, thus driving down prices for consumers and increasing transparency in charging prices. This, in turn, can strengthen the economic case for switching away from ETS2-covered fuels, supporting faster ZEV uptake across the fleet, which in turn reduces fossil fuel demand, lowers demand for ETS2 allowances, and eases carbon price pressure for all consumers of ETS2-covered fuels.

Measures to reduce flexible pricing models of charge point operators and mobility service providers

The proposed restrictions on flexible pricing models of CPOs and MSPs could have a mixed/unclear impact on consumer exposure to ETS2 cost impacts (+/-), with both potentially negative and positive effects on consumer exposure to ETS2 cost impacts.

Intervention on pricing structures could lead to increased overall prices for consumers, who can currently benefit from flexible pricing schemes, such as subscriptions and dynamic pricing, which also encourage competition among providers (Electra, 2026). Thus, opponents of this measure argue that further regulation on price-setting would be burdensome to operators without additional benefit to consumers (Tesla Motors Netherlands B.V., 2026) (ChargeUp Europe, 2026). From an ETS2 perspective, this matters because higher and less competitive charging prices would weaken the economic incentive for consumers to switch away from ETS2-covered fuels, slowing ZEV uptake and, in turn, sustaining fossil fuel demand, ETS2 allowance demand and consumer exposure to ETS2 cost impacts. Specifically:

- Restricting dynamic pricing could reduce charging network utilisation, as price signals are one of the main tools available to shift demand toward off-peak periods; lower utilisation, in turn, is associated with higher charging prices
- Reduced competition among CPOs and MSPs could dampen the price-lowering effects expected from the fair tender and concession measures discussed above, partially offsetting their positive ETS2 interaction.
- Higher average charging prices weaken the economic case for switching away from ETS2-covered fuels and potentially slowing ZEV uptake

Despite the concerns raised above, the proposed restrictions on flexible pricing models could also generate a positive interaction with ETS2 by promoting ZEV uptake by:

- Increasing transparency and predictability of charging prices, enabling consumers to anticipate charging costs, compare them across operators, and benchmark them against ICE fuel costs,
- Protecting against volatile pricing for consumers with limited charging flexibility
- Limiting anti-competitive or exploitative pricing practices, reinforcing the positive effects expected from the fair tender and concession provisions, ensuring that gains in competition are actually passed through to consumers rather than absorbed through complex pricing structures.

Reducing legal and commercial uncertainty by clarifying what constitutes "proportionate and objectively justified" pricing differentiation; clearer boundaries on permissible price differentiation would give consumers greater confidence that charging prices are fair and comparable, while giving operators a stable framework to invest in and expand charging provisionSimilarly, the proposal to allow prices at publicly accessible charging stations to reflect developments in the electricity market could also have mixed effects for consumers in terms of its ETS2 interaction:

- Consumers with access to flexible charging options (e.g. overnight home charging, workplace charging) could benefit from lower charging prices during off-peak hours, improving ZEV affordability and reinforcing the shift away from ETS2-covered fuels.
- Consumers who rely on publicly accessible charging and cannot shift their charging times — including shift workers, users of public fast charging, and commercial operators with fixed schedules — could be burdened with more volatile or higher overall pricing. For these consumers, the measure could weaken the economic incentive to switch to a ZEV, effectively keeping them more exposed to ETS2 costs than they would otherwise be.

Distributional impacts of ETS2 interaction

In terms of distributional impacts, all proposed changes would have broadly shared impacts among all consumers of ETS2-covered fuels, since any resulting ZEV uptake would reduce fossil fuel demand, lower ETS2 allowance demand and ease carbon price pressure for the entire pool of remaining fuel users. Direct beneficiaries are the consumers who take up ZEVs thanks to improved infrastructure, pricing and market conditions, while indirect beneficiaries are all other consumers still exposed to ETS2-covered fuel costs. The combined effect is expected to be mildly progressive, as the measures specifically address barriers that disproportionately affect lower-income households,

urban consumers without private charging, users in underserved regions, and small businesses — precisely the groups most exposed to ETS2-related fuel cost increases.

4.3.5 Renewable Energy Directive III (RED)

Background to the regulation

The Renewable Energy Directive III (**DIRECTIVE (EU) 2023/2413) (RED III)** entered into force in November 2023, acting as an amendment to the two prior versions of the Directive. This latest version implements increased targets for renewable energy and fuels within the transport sector. The main aspects pertaining to transport are:

- Increasing the target share of renewable energy in road transport from 14% to 29% by 2030, OR a reduction of at least 14.5% greenhouse gas (GHG) emissions by 2030
- Increasing the target share of advanced biofuels and renewable fuels of non-biological origin (RFNBOs) from 3.5% to 5.5%, with the added target of a minimum share of 1% RFNBOs
- Establishment of a credit mechanism: charge point operators will receive credits for the renewable electricity they publicly supply to EVs. CPOs can then sell these credits to fuel suppliers to help them meet obligations for renewable energy share.

These measures intend to accelerate the transition to renewable energy in the transport sector whilst financially incentivising certain fuels and use cases. The first element, which provides two alternative targets for Member States, provides Member States with flexibility in their implementation pathways, thereby enabling them to reach decarbonisation goals based on their capacity to scale up certain fuel technologies (Hydrogen Europe, 2025).

Assessment

Table 4-6 summarises the expected interactions between RED III and ETS2:

Table 4-6: Renewable Energy Directive III – Expected interactions with ETS2

Element / modality	Type of interaction with ETS2
Increased renewable energy target in transport Increased sub-targets for biofuels and RFNBOs Credit mechanism rewarding renewable electricity supplied to EVs and allowing credits to be traded with fuel suppliers	Reduces consumer exposure to ETS2 cost impacts (+)

Renewable energy mandates

As a supply-side policy, RED III will directly reduce fossil fuel demand by mandating an increased share of renewable energy and alternative fuels in the transport sector, translating into lower demand for carbon allowances and, therefore, reduced ETS2 price pressures on consumers.

The Directive will directly interact with ETS2 legislation which designates biomass and biofuels that comply with the strict RED III sustainability and GHG savings criteria as "zero-rated", representing a strong incentive for fuel suppliers to increase the share of RED III-compliant renewables in their blends as they do not have to surrender ETS2 allowances for this share. This will:

- Directly reduce the ETS2 cost passed through to consumers at the pump
- Strengthen the business case for compliant renewable fuel production, accelerating supply-side investment and further reducing the fossil fuel share over time, continuing to lower ETS2 price pressure.

Credit mechanism rewarding renewable electricity supplied to EVs

The credit mechanism will provide an additional route for fuel suppliers to meet their renewable energy obligations, reducing the fossil fuel demand covered by ETS2, and therefore, lowering ETS2 price pressure. Furthermore, the credit mechanism will generate a new revenue stream for CPOs. This is expected to incentivise an increase in EV charging capacity, enabling the uptake of ZEVs (ACEA, 2021), and reducing barriers for ZEV adoption among consumers via the rollout of a more robust charging network, indirectly accelerating the shift away from ETS2-covered fuels.

Distributional impacts of ETS2 interaction

The ETS2-related benefits of RED III are expected to accrue broadly across all consumers of ETS2-covered fuels, since the Directive operates primarily through the fuel supply chain: any share of fossil fuel displaced by RED III-compliant renewables reduces the ETS2 allowance cost embedded in the fuel price faced by all consumers at the pump. In this sense, the benefits do not depend on a consumer purchasing a new vehicle, accessing charging infrastructure or interacting with the label — they materialise automatically for anyone buying fuel covered by the Directive, with particularly meaningful relief for the consumer segments that would otherwise remain most exposed to ETS2 costs: fossil-fuel-dependent consumers, and rural and peripheral consumers.

4.4 Summary table

Error! Reference source not found. Error! Reference source not found.summarises the assessment of the interaction between the analysed transport regulations and initiatives and ETS2.

Table 4-7: Summary of interactions of ETS2 with other EU transport regulations

Element	Type of interaction with ETS2	Justification
Proposed amendments to CO_2 emission standards for LDVs		
Lower 2035 CO_2 target (90% instead of 100%), alternative fuel compensation mechanism (fuel credits)	Mixed / unclear impact on consumer exposure to ETS2 cost impacts	The combination of these two measures could, in principle, offset part of the additional emissions arising from a less ambitious CO_2 target, but in practice several factors limit its capacity to deliver meaningful ETS2 cost relief for consumers, including: the prolonged presence of ICE and hybrid vehicles in the fleet that can still operate on fossil fuels; the Limited scale of the mechanism; and the overlap with RED III obligations, meaning that a significant share of the alternative fuels rewarded under the CO_2 standards' fuel credits mechanism is likely to come to the market regardless of the credits.
Banking and borrowing mechanism, and pooling arrangements	Increases consumer exposure to ETS2 cost impacts (-)	These measures increase flexibility for manufacturers and reduce the pace at which fleet-wide emissions must decline. By allowing a continued role for ICE vehicles, hybrids and PHEVs and by reducing short-term compliance pressure, they are expected to delay ZEV uptake and prolong fossil fuel demand. This would increase or sustain demand for ETS2 allowances, contributing to higher ETS2 carbon price pressure and continued exposure of consumers to ETS2-related fuel costs.
Super credits for small affordable zero-emission vehicles	Mixed / unclear impact on consumer exposure to ETS2 cost impacts	The measure aims to stimulate the production of smaller and more affordable ZEVs, potentially increasing access to low-emission mobility and reducing consumers' future exposure to ETS2-related fuel costs. This could be particularly beneficial for lower-income households if it expands the availability of affordable electric vehicles. However, some stakeholders argue that the crediting mechanism could allow manufacturers to meet compliance obligations while selling fewer ZEVs overall, reducing the expected impact on fleet electrification. The overall effect on fossil fuel demand, ETS2 allowance demand and consumer exposure to ETS2 costs therefore remains uncertain.
Excess emission premiums	Reduces consumer	Excess emission premiums incentivise manufacturers to comply with CO_2 targets and accelerate the deployment of ZEVs. By supporting

Element	Type of interaction with ETS2	Justification
	exposure to ETS2 cost impacts (+)	faster reductions in fossil fuel demand, the mechanism can contribute to lower ETS2 allowance demand and reduced carbon price pressure over time. This can improve consumers' ability to avoid ETS2-related fuel costs and support the availability of low-emission vehicle options. However, the magnitude of the effect remains uncertain because the penalty level has remained unchanged since 2009 and evidence on its practical influence on manufacturer behaviour is limited.
Low-carbon steel compensation mechanism, eco-innovation credits, and derogations for small-volume and niche manufacturers	Limited / negligible impact on consumer exposure to ETS2 cost impacts	These elements are not expected to materially affect fossil fuel demand during vehicle use and therefore have little direct interaction with ETS2. Low-carbon steel credits address embedded emissions in vehicle production rather than fuel consumption, eco-innovations have delivered only modest real-world emission reductions to date, and derogations apply to a limited number of manufacturers. Consequently, their impact on ETS2 allowance demand, carbon prices and consumers' exposure to ETS2-related fuel costs is expected to be limited or negligible.
Proposed Regulation on Clean Corporate Vehicles (CCVR)		
Mandatory national targets for minimum shares of zero- and low-emission vehicles in large corporate fleets, coupled with financial assistance	Reduces consumer exposure to ETS2 cost impacts (+)	The targets are expected to accelerate ZEV uptake in high-mileage corporate fleets, directly reducing fossil fuel demand and lowering ETS2 allowance demand and carbon price pressure. The ETS2-related cost relief is expected to be broadly distributed across all consumers of ETS2-covered fuels. The effect is expected to be reinforced through the second-hand market, as faster corporate fleet turnover may also increase the supply of second-hand ZEVs for private consumers, improving consumers' access to affordable low-emission vehicles and also directly reducing their exposure to ETS2-related fuel costs.
Proposed amendments to the Car labelling Directive		
Inclusion of new information elements for ZEVs, PHEVs and used EVs Extension of scope to new vans and second-hand cars and vans. Harmonised EU vehicle label design based on the energy label model Online product database enabling comparison across vehicle models and manufacturers	Enable lower consumer exposure to ETS2 cost impacts (+)	Improved, harmonised and more easily accessible information can positively impact consumer's purchasing behaviour, indirectly supporting the uptake of more fuel-efficient and zero-emission vehicles. This may gradually reduce fossil fuel demand and ETS2 allowance demand, ease ETS2 carbon price pressure and improve consumers' ability to avoid ETS2-related fuel cost increases. The ETS2-related benefits are expected to accrue broadly across the full spectrum of vehicle users, but it is worth making a distinction: • Direct beneficiaries will be those better equipped to identify vehicles with lower fuel or energy consumption and lower future exposure to ETS2-related fuel costs. • Indirect beneficiaries will be all remaining fossil-fuel users.
Upcoming review of the Alternative Fuels Infrastructure Regulation (AFIR)		

Element	Type of interaction with ETS2	Justification
Adjustments to recharging infrastructure targets Regional sub-targets for recharging infrastructure User-friendliness measures, including wider card payment acceptance, improved price transparency and accessibility for users with disabilities Measures to ensure fair tender and concession practices	Enable lower consumer exposure to ETS2 cost impacts (+)	Although these measures do not directly incentivise the purchase of zero-emission vehicles, they interact with ETS2 indirectly by removing key barriers to ZEV adoption (such as range anxiety, network gaps and user experience) and tackling the market concentration of CPOs that can otherwise keep charging prices high and discourage ZEV adoption, therefore contributing to reduce fossil fuel demand and ETS2 cost impacts. These changes would have broadly shared impacts among all consumers of ETS2-covered fuels, since any resulting ZEV uptake would reduce fossil fuel demand, lower ETS2 allowance demand and ease carbon price pressure for the entire pool of remaining fuel users. Direct beneficiaries are the consumers who take up ZEVs thanks to improved infrastructure, pricing and market conditions, while indirect beneficiaries are all other consumers still exposed to ETS2-covered fuel costs.
Measures to reduce flexible pricing models of charge point operators and mobility service providers	Mixed / unclear impact on consumer exposure to ETS2 cost impacts (+/-)	The proposed restrictions on flexible pricing models of CPOs and MSPs could have a mixed/unclear impact on consumer exposure to ETS2 cost impacts (+/-), with both potentially negative and positive effects on consumer exposure to ETS2 cost impacts. Potential negative effects include increased overall prices for consumers as a result of reduced competition, and reduced charging network utilisation, discouraging ZEV uptake. Potential positive effects promoting ZEV uptake include greater transparency and predictability of charging prices, protection against volatile pricing for consumers with limited charging flexibility, and limiting anti-competitive or discriminatory practices.
Renewable Energy Directive (RED) III		
Increased renewable energy target in transport and increased sub-targets for advanced biofuels and RFNBOs Credit mechanism rewarding renewable electricity supplied to EVs and allowing credits to be traded with fuel suppliers	Reduces consumer exposure to ETS2 cost impacts (+)	These measures directly reduce fossil fuel demand in the transport sector by requiring a greater share of renewable energy and low-carbon fuels. They therefore reduce demand for ETS2 allowances and contribute to lower ETS2 carbon price pressure compared with a scenario without RED III. The Directive also creates a direct interaction with ETS2 because eligible biofuels, RFNBOs and other renewable fuels meeting RED III sustainability criteria can be zero-rated under the ETS monitoring and reporting framework, meaning fuel suppliers do not need to surrender ETS2 allowances for the qualifying renewable share. The credit mechanism will provide an additional route for fuel suppliers to meet their renewable energy obligations, reducing the fossil fuel demand covered by ETS2, and therefore, lowering ETS2 price pressure. Furthermore, it can encourage investment in charging infrastructure and support ZEV uptake.

5. Consumer impact, equity considerations and end-user perspective (Task 4)

5.1 Classification of user groups

Sections 2 (Task 1) and 3 (Task 2) established the price signal that ETS2 will send to road-transport fuels and the policy tools available to mitigate it:

- Task 1 quantified the expected fuel-price impact under three ETS2 carbon-price scenarios and mapped Member State exposure through an adjusted exposure index combining fuel consumption, income, fuel-expenditure burden, EV uptake and existing carbon-pricing frameworks. Step 3 of that analysis extended the assessment to the household level, showing how the same EU-wide price signal translates into differentiated transport-expenditure impacts by income quintile and by urban-rural territory (Figure 2-12 to Figure 2-14).
- Task 2 reviewed the Social Climate Fund and the priority clause of the ETS2 Directive, identifying the revenue channels available to protect vulnerable households and road users.

Task 4 digs deeper into these themes, and considers whether the transition ETS2 accelerates is **affordable, accessible and offers real mobility choices to the different groups of road users FIA represents**.

The chapter is structured around three end-user dimensions: **affordability, accessibility, and mobility choice**.

- **Affordability** captures the capacity of households to absorb the running cost of ETS2, to access a compliant vehicle, and to fund alternatives to the private car.
- **Physical accessibility** captures the physical and infrastructural conditions that determine whether households can effectively use those alternatives, including public transport provision, home and public charging, and the availability of adapted vehicles.
- **Mobility choice** captures the range of options households can realistically exercise once affordability and accessibility constraints are accounted for, and the risk that certain groups are locked into fossil-fuel car ownership by default.

These three dimensions are read through a classification of specific road users, organised around three groups defined by their primary discriminator. The classification is summarised in Table 5-1 below.

Table 5-1. Typology of vulnerable user groups, by primary driver of exposure

Group	Primary discriminator	Sub-segments to retain
1. Vulnerable users	**Income constraint:** limited capacity to absorb fuel-cost increases or to invest in cleaner alternatives	• Low-income households reliant on private ICE vehicles for essential mobility, particularly commuting and/or where vehicles are older and less fuel-efficient. • Households in transport poverty, where mobility already absorbs a disproportionate share of disposable income
2. Rural users	**Geographic:** Long distances, dispersed activity patterns and structurally weak transport provision linked to location	• Rural and remote peri-urban households facing long commutes to employment, education or healthcare • Multi-car households where a second vehicle is a necessity driven by distance and dispersed daily activity patterns • Agricultural users reliant on diesel vehicles or machinery for professional activities, where rural location, operating conditions, distance and limited alternative options constrain the transition.
3. Users with limited access to alternatives	**Supply-side / infrastructural:** absence of a viable alternative to the ICE	• Households in urban and peri-urban areas without a viable public transport (PT) network, including night, weekend and shift-hour service gaps

Group	Primary discriminator	Sub-segments to retain
	private car or diesel utility vehicle, independent of income or location	• Residents without access to home charging: apartment dwellers and households without private parking • Persons with reduced mobility (PRM) facing physically inaccessible PT and charging infrastructure • Self-employed users reliant on diesel vans, where suitable zero-emission utility vehicles remain limited in terms of range, payload, cost or recharging practicality.

Note: Categories are defined by their primary discriminator. Real-world users often sit at the intersection of two or more groups (e.g. low-income rural households, PRM in transport poverty); the classification reflects the dominant driver of vulnerability to the transition, not mutually exclusive populations.

The remainder of the chapter applies this framework in turn, identifying for each user group where ETS2 amplifies existing constraints, where the transition it accelerates opens new options, and where policy intervention is needed to prevent affordability, accessibility or choice gaps from widening.

5.2 Impacts on affordability

Affordability captures the capacity of households to bear the total cost of mobility under ETS2. Section 2.2.3 has quantified the distributional impact of ETS2-related fuel-price increases across income quintiles and urban-rural territories at EU level (Figure 2-12 to Figure 2-14). This section re-reads those findings through the three user groups defined in Table 5-1 and extends the assessment to other two cost components that determine whether households can absorb the transition ETS2 accelerates.

Under ETS2, a household facing rising fuel-cost pressure has three possible responses, each associated with a distinct cost component:

- **Remaining in an ICE vehicle** and absorbing the fuel-price increase → **running cost**.
- **Switching to a ZEV** (including the cost of charging that vehicle (home vs public charging tariff differential for households without private parking → **vehicle-access cost**.
- **Reducing car use** and relying on alternatives (public transport, shared mobility, active modes) → **alternatives cost**.

Whether each response is realistic depends on the interaction between these three cost components and the primary discriminator of each user group.

5.2.1 Vulnerable users

For vulnerable users, affordability is primarily shaped by income constraints. ETS2 increases the running cost of continued ICE vehicle use, but the households most exposed to this fuel-price signal are often those with the least capacity to respond: they may be unable to absorb higher fuel bills, finance the upfront cost of switching to a zero-emission vehicle, or rely on affordable alternatives where public transport or shared mobility options are limited, unsuitable or costly. This subsection assesses these impacts through both a review of the literature and an illustrative quantitative analysis for selected Member States. Together, these sources are used to examine vulnerable users across the three affordability pathways identified above: the cost of remaining in an ICE vehicle, the cost of accessing a cleaner vehicle, and the cost and availability of alternatives to private car use.

Evidence from the literature

Low-income households reliant on an ICE vehicle for essential mobility

For these households, ETS2 amplifies a fuel-cost burden that already weighs heavily on the budget. Task 1 established that the additional transport expenditure imposed by a €100/tCO_2 ETS2 price concentrates on the lowest income quintiles in the majority of the Member States reviewed, in both absolute and relative terms (only Hungary and Bulgaria are the exception, see Section2.2.3, Figure 2-12).

Two structural factors intensify this exposure for low-income households that own a car, while a third distributional nuance qualifies where the burden falls hardest:

- First, **low-income households own a disproportionate share of older**, **less fuel-efficient ICE vehicles**. Because these vehicles consume more fuel per kilometre, a given €/litre pass-through translates into a larger absolute cost increase per kilometre driven than for higher-income households with newer, more efficient models (T&E, 2026).
- Second, **road-fuel demand for essential journeys is highly price-inelastic for this cohort in the short run.** This is not because they are indifferent to price, but because they have the fewest ways to respond: the vehicle stock is fixed, no affordable cleaner alternative is available, and viable public or active-transport options are often absent. Higher-income households can adjust by switching to a more efficient or electric vehicle, or to public transport; lower-income households frequently cannot, leaving little scope to absorb further fuel-cost increases without reducing spending on other essentials (Reaños & Varal, 2026)
- Third, **the distributional pattern is not linear across the income scale**. Many first-quintile households do not own a car at all and therefore face no direct ETS2 exposure. As a result, the direct burden in several Member States falls mostly on the second quintile (instead of the first one): low-income households that do depend on a car for essential mobility.

The households most exposed to these fuel-price increases are also those least able to respond through vehicle replacement. While battery-electric vehicles increasingly offer lower lifetime running costs than equivalent combustion vehicles, purchase price remains the primary barrier to adoption for lower-income households, **since Q1-Q2[37] households almost never buy new vehicles** (IEA, 2025). The Commission's own affordability modelling confirms the severity of this constraint. In the new-car market, the two lowest income quintiles cannot afford any vehicle segment, from small to large, across every powertrain, scenario and year modelled to 2040 (European Commission, 2025). Access begins only in the second- and third-hand markets, and even there zero-emission options are the last to become reachable (European Commission, 2025). These households therefore depend structurally on the second-hand market to renew their fleet, but **the supply of second-hand BEVs at accessible price points remains thin**, so used ICE vehicles remain the default (ICCT, 2021) (BEUC, 2025).

Although average BEV prices have begun to decline and additional lower-cost models are entering the market, price parity with equivalent ICE vehicles has not yet been reached across all segments, particularly the small-car and second-hand segments most relevant to lower-income consumers (T&E, 2026). Access to financing further compounds the challenge, as low-income families often face more constrained borrowing conditions, including lower creditworthiness, higher interest rates and stricter lending requirements, and therefore reduced access to vehicle finance (BEUC, 2024). Consequently, although second-hand BEVs can offer lower total ownership costs than equivalent petrol cars, their limited supply and higher upfront purchase prices continue to restrict access for lower-income households (BEUC, 2025). Across the 14 largest EU markets, the median price gap between used BEVs and ICE vehicles remained just under €15,000 in February 2026, despite a recent decline in BEV prices (AutoUncle, 2026).

Households in transport poverty

For households already in transport poverty, ETS2 acts on a budget in which mobility already absorbs a disproportionate share of disposable income, so the same fuel-cost increase carries greater consequences. The European Commission defines transport poverty as the **inability or difficulty to meet the cost of private or public transport,** or the lack of access to essential services owing to limited transport options (see section 5.4.1) (European Commission, 2025). For this subgroup, the combined effect of higher fuel costs, limited scope to replace the vehicle and constrained alternatives risks pushing a growing share of low-income households further into, or newly into, transport poverty.

Reducing car use could in principle mitigate exposure to ETS2, but for these households this pathway is frequently constrained by the affordability of the alternatives themselves. Where public transport is available, transport expenditure already represents a significant share of disposable income for many low-income households, **and a marginal fare increase can absorb the savings from switching away from the car** (UITP, 2025). Evidence from Germany's €9-ticket scheme illustrates how strongly fare level itself shapes behaviour: reducing fares to a symbolic level significantly increased access to activities, services and social participation among lower-income households

[37] Refer to the first and second quintiles (the bottom 40%) of the income distribution. Q1 represents the lowest 20% and Q2 represents the next 20% of households.

that had previously been priced out (Rozynek, 2024). The effectiveness of ETS2 therefore depends also on the fare structure of the alternatives, since a modal shift that merely transfers the household from a fuel bill to a public-transport subscription of equivalent magnitude does not deliver the affordability relief that ETS2 revenue recycling is intended to secure.

Where income constraints combine with a rural or peripheral location, the affordability pressure of higher rural mileage adds to the fuel-bill exposure of this cohort, an intersection with rural users discussed in section 5.2.2. Where they combine with structural blockages of vehicle-access or alternatives, for example a low-income apartment dweller without home charging, the intersection with users with limited access to alternatives discussed in section 5.2.3 also applies.

Illustrative quantitative analysis of affordability impacts

To complement the qualitative assessment above, this subsection provides an illustrative quantitative analysis for four selected Member States. The purpose is not to produce a full EU-wide distributional model, but to test how ETS2-related fuel-price increases may affect household transport-fuel burdens in contrasting national contexts. The analysis focuses on vulnerable users by estimating how expenditure on fuels and lubricants for personal transport equipment varies across income quintiles and how this changes under the ETS2 medium price scenario.

Selection of Member States

The four Member States were selected to reflect the range of exposure profiles identified in Section 2.2.2, rather than to focus only on the highest-risk cases. Together, Poland, Greece, France and the Netherlands allow the analysis to compare how similar ETS2-related fuel-price pressures affect households in contexts with different levels of fuel dependence, income resilience, fuel-expenditure burden and transition capacity.

Table 5-2. Selected Member States and their role in the ETS2 exposure sample

Member State	Role in the sample	Rationale for inclusion
Poland	High-exposure, large Central/Eastern European case	Represents a large Member State where fuel dependence, affordability constraints and observed fuel burden are important, while also being relevant for EU-wide ETS2 price dynamics.
Greece	Southern European affordability-risk case	Captures the interaction between low-income resilience and high fuel expenditure burden, making it particularly relevant for examining transport poverty risks.
France	Medium-exposure, large Western European case	Provides a policy-relevant case where average exposure is more moderate, but territorial variation, car dependence and social sensitivity to fuel prices remain important.
Netherlands	Lower-exposure, higher-resilience benchmark	Provides a contrasting benchmark, with stronger income resilience, lower fuel burden and higher transition capacity.

This selection provides four deliberately contrasting case-study contexts: a high-exposure Central and Eastern European Member State, a Southern European affordability-risk case, a large Western European case with medium exposure and important territorial variation, and a lower-exposure benchmark with stronger transition capacity. The quantitative results should therefore be read as illustrative of different vulnerability profiles, rather than as a statistically representative EU-wide estimate.

Method in brief

The analysis uses a deliberately simple expenditure-based approach. The detailed calculations are presented only to the extent needed to make the case-study results transparent:

- The national HBS expenditure share for CP0722 “Fuels and lubricants for personal transport equipment” is used as the baseline transport fuel burden in each Member State.
- Because CP0722 is not available by income quintile, expenditure on CP045 “Electricity, gas and other fuels” by income quintile is used to derive a within-country distributional adjustment factor, with the third quintile used as the reference group.

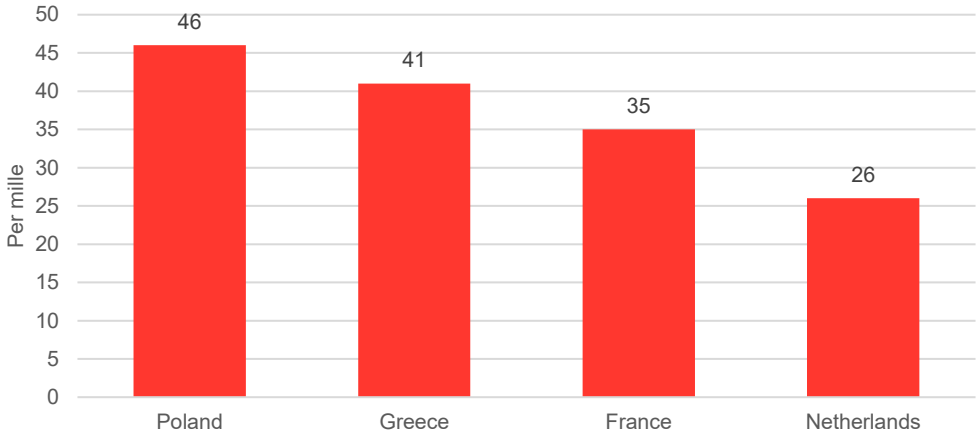
- The ETS2 medium-scenario petrol and diesel price increases are converted into percentage shocks using baseline retail fuel prices in each Member State.
- Petrol and diesel shocks are combined into a single CP0722 price shock using the national road-fuel split.
- The post-ETS2 burden is compared with an indicative 6% transport affordability threshold, while recognising that the results represent quintile averages and may mask within-quintile variation.

Results and interpretation

The results highlight three points that are most relevant for vulnerable users: Poland and Greece start from higher baseline road-fuel expenditure burdens; lower-income quintiles consistently face higher estimated burdens than higher-income quintiles; and the country-specific ETS2 price shock is largest where baseline fuel prices are lower.

At national level, Poland has the highest CP0722 expenditure share, at 46 per mille[38] of household consumption expenditure, followed by Greece at 41 per mille and France at 35 per mille. The Netherlands has the lowest baseline burden, at 26 per mille. This confirms that Poland and Greece enter the analysis with higher direct exposure to road-fuel expenditure, while the Netherlands provides a lower-exposure benchmark.

Figure 5-1. Expenditure in CP0722 "Fuels and lubricants for personal transport equipment" (per mille), 2020

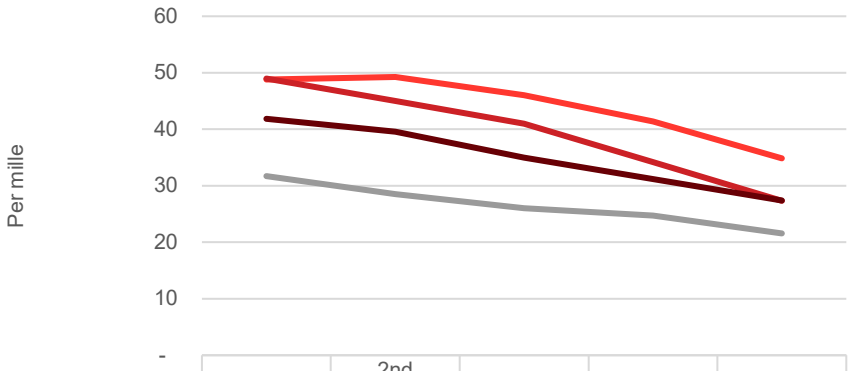


Source: WSP elaboration on Eurostat data: Structure of consumption expenditure by COICOP consumption purpose [hbs_str_t211__custom_21327923]

When the burden is distributed across income quintiles, a clear income gradient appears in all four countries. In Poland, the estimated baseline burden is 49 per mille for the first two quintiles, compared with 35 per mille for the fifth quintile. Greece shows a similar pattern, with the first quintile at 49 per mille and the fifth quintile at 27 per mille. France and the Netherlands display lower overall burdens, but the downward gradient across the income distribution is consistent. This means that lower-income households are already estimated to face higher relative exposure before the ETS2 price shock is applied.

[38] 46‰, meaning that expenditure on fuels and lubricants for personal transport equipment represents 46 per 1,000, or 4.6%, of total household consumption expenditure.

Figure 5-2. Estimated illustrative CP0722 “Fuels and lubricants for personal transport equipment” burden by income quintile, before ETS2 (per mille)

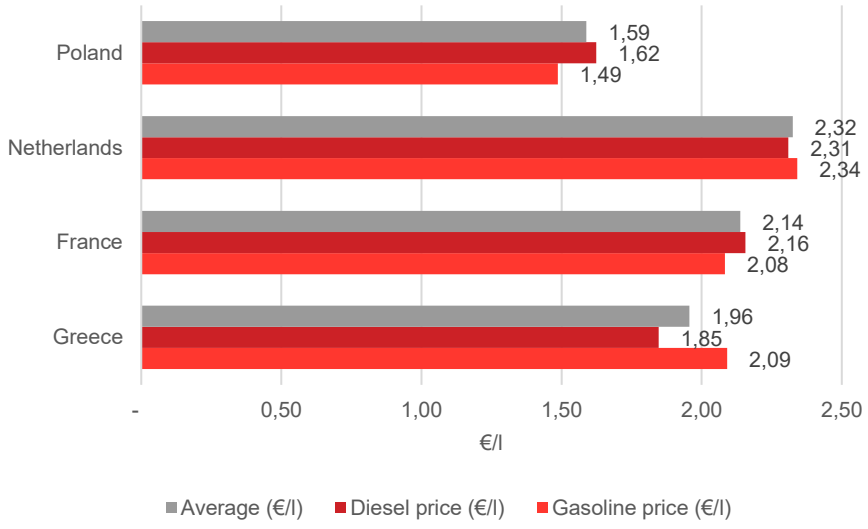


	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Poland	49	49	46	41	35
Greece	49	45	41	34	27
France	42	40	35	31	27
Netherlands	32	29	26	25	22

Source: WSP elaboration on Eurostat data: Structure of consumption expenditure by COICOP consumption purpose [hbs_str_t211__custom_21327923] and Structure of consumption expenditure by income quintile and COICOP consumption purpose [hbs_str_t223]

Baseline petrol and diesel prices determine how the ETS2 cent-per-litre impacts translate into percentage price shocks. Poland has the lowest baseline fuel prices among the selected countries, with petrol at €1.49/l and diesel at €1.62/l, so the same ETS2 increase translates into a larger percentage change. The Netherlands has the highest baseline prices, with petrol at €2.34/l and diesel at €2.31/l, which reduces the percentage effect of the same ETS2 increase.

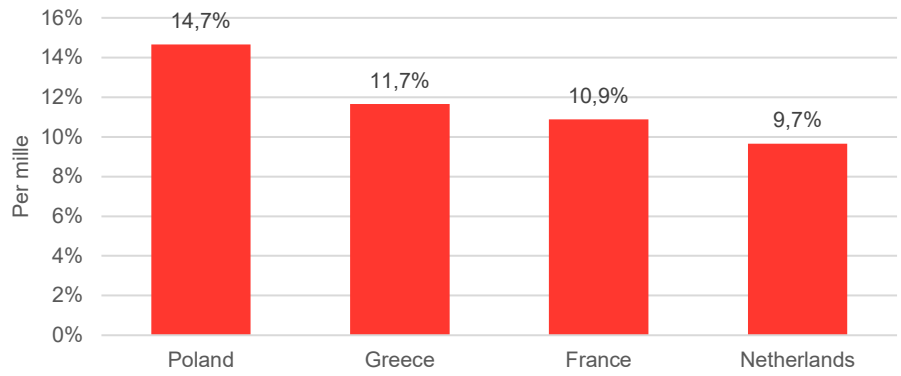
Figure 5-3. Baseline petrol and diesel retail prices in the selected Member States (€/l)



Source: WSP elaboration on European Commission - Weekly Oil Bulletin data and Eurostat data: Complete energy balances [nrg_bal_c__custom_21530502]

The combined CP0722 price shock is therefore highest in Poland, at 14.7%, followed by Greece at 11.7% and France at 10.9%. The Netherlands records the lowest shock, at 9.7%. This shows that ETS2 exposure depends not only on the scenario price increase, but also on the starting level of retail fuel prices and the national fuel mix.

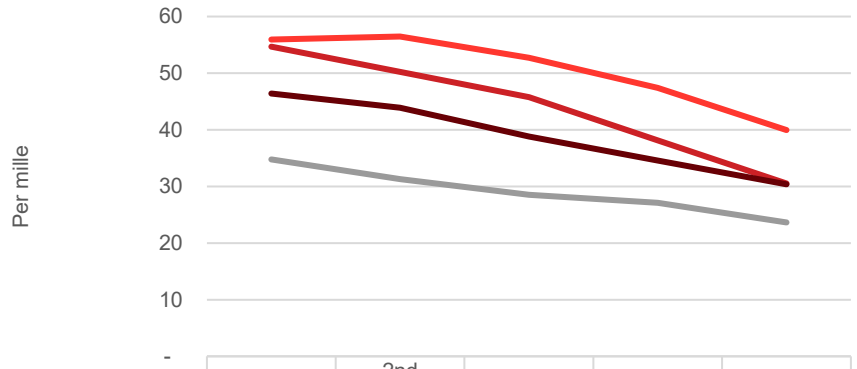
Figure 5-4. Combined CP0722 price shock under the ETS2 medium scenario (%)



Source: WSP elaboration

After applying the country-specific CP0722 price shock, Poland records the highest post-ETS2 burdens, reaching 56 per mille for the first and second quintiles and 53 per mille for the third quintile. Greece also records relatively high burdens, at 55 per mille for the first quintile, 50 per mille for the second quintile and 46 per mille for the third quintile. France remains below these levels, with the first quintile reaching 46 per mille, while the Netherlands remains the lowest-exposure case, with its first quintile reaching 35 per mille. These results confirm that the affordability impact is shaped by the interaction between baseline fuel expenditure, income position and the country-specific price shock.

Figure 5-5. Estimated illustrative CP0722 burden by income quintile after applying the ETS2 medium scenario (per mille)



	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
Poland	56	56	53	47	40
Greece	55	50	46	38	31
France	46	44	39	35	30
Netherlands	35	31	29	27	24

Source: WSP elaboration

Implications for transport affordability risk

The post-ETS2 results are interpreted against the indicative 6% transport affordability threshold used in EU-level work on transport poverty indicators (European Commission, 2025). The threshold is applied here as a benchmark for affordability pressure, not as a definitive transport poverty line, because the analysis captures only expenditure

on fuels and lubricants for personal transport equipment and does not include public transport fares, vehicle purchase costs, maintenance, insurance, accessibility constraints or unmet travel needs.

None of the selected country-quintile averages exceeds the 6% threshold after the medium-scenario fuel price shock. However, several lower-income groups move close to it: Poland's first, second and third quintiles reach 56, 56 and 53 per mille respectively, while Greece's first and second quintiles reach 55 and 50 per mille. These groups are therefore best interpreted as facing moderate to elevated affordability pressure approaching the threshold, rather than crossing it at the quintile-average level. France and the Netherlands remain further below the threshold across all quintiles.

The fact that quintile averages remain below the threshold should not be interpreted as meaning that no households exceed it. The estimates represent average burdens within each income quintile, and there is likely to be substantial variation within each group depending on location, car dependence, commuting needs, vehicle efficiency and access to alternatives. In particular, some households within the first and second quintiles, especially in Poland and Greece, may already face or be pushed above the 6% benchmark even where the quintile average remains below it.

These results reinforce the wider affordability assessment: even where average quintile-level burdens remain below an indicative threshold, ETS2-related price increases are most likely to intensify pressure among households already constrained by low income, high fuel dependence or limited ability to switch vehicle or mode. The following sections consider how these risks are further amplified where income vulnerability intersects with rurality or limited access to alternatives.

Key findings on affordability impacts for vulnerable users

Overall, both the literature and the illustrative quantitative analysis point to the same conclusion: vulnerable users are most exposed where low income combines with continued dependence on private ICE vehicles and limited ability to switch to lower-cost alternatives.

The literature shows that low-income households are more likely to rely on older, less fuel-efficient vehicles, face short-run inelastic demand for essential car trips, and encounter significant barriers to vehicle replacement or affordable modal shift.

The quantitative analysis reinforces this pattern, showing that lower-income quintiles consistently face higher estimated transport-fuel expenditure burdens than higher-income groups, with the strongest pressures observed in Poland and Greece. Although the average burden for each country-quintile group remains below the indicative 6% transport affordability threshold under the ETS2 medium scenario, this masks within-quintile variation: some lower-income households, particularly those with high car dependence or limited access to alternatives, may already exceed or be pushed above this benchmark.

The main affordability risk for vulnerable users is therefore not only the immediate fuel-price increase, but the combination of higher running costs, constrained replacement options and limited access to genuinely affordable alternatives.

5.2.2 Rural users

For rural users, affordability is shaped primarily by geography. Rural households rely more heavily on private cars, reflecting dispersed settlement patterns and weaker access to public transport (European Commission, DG EMPL, 2024). This greater reliance on private cars can increase their exposure to ETS2-related fuel-price increases. At equivalent income, rural households face a larger transport-expenditure increase than urban households from the same per-litre pass-through. Task 1 showed that urban-rural differences are highly country-specific and do not reveal a uniform rural premium (see Section **Error! Reference source not found.**2.2.3, Figure 2-13). Nevertheless, rural households can face greater structural exposure where longer travel distances, weaker public transport provision and limited access to alternatives increase dependence on private vehicles.

Rural and remote peri-urban households

For these households the core driver is distance. As stated above, average distance per trip is longer so the fuel bill under ETS2 is higher than in urban areas (European Commission, DG EMPL, 2024). The pathway to reduce this exposure through vehicle replacement is constrained for economic reasons that compound infrastructural ones. BEV models adapted to rural use profiles, with longer range and higher payload, **remain limited at accessible price points, so the upfront-price premium of a compatible BEV over an equivalent ICE vehicle is higher for rural**

users than for urban users buying a smaller, shorter-range model (T&E, 2026). Lower charging-infrastructure density in rural areas can further reduce the economic attractiveness of BEVs: households that rely more frequently on public fast charging face higher electricity costs than those able to charge at home, narrowing the operating-cost advantage of BEVs over conventional vehicles (BEUC, 2024) (IEA, Global EV Outlook 2025, 2025).

Modal shift offers little relief either, **since where public transport is nominally available it may not be affordable at the frequency required by long rural commutes**, and multi-trip subscriptions and season tickets are calibrated on urban distances (UITP, 2025). Emerging demand-responsive and shared-mobility schemes are being piloted in several Member States, **but their per-passenger-km cost is often higher** than urban fixed-route public transport owing to lower density and limited economies of scale (European Commission, DG EMPL, 2024). As a result, this subgroup faces affordability pressure at every pathway: an amplified fuel bill, a higher replacement premium with a weaker total-cost-of-ownership advantage, and alternatives that are often unaffordable at rural frequencies.

Multi-car households

For rural multi-car households, the affordability pressures set out for rural users above apply once per vehicle. The same per-litre pass-through therefore raises the household's transport expenditure several times over, and any switch to a zero-emission vehicle would have to be financed across the whole fleet rather than a single car. What is specific to this subgroup is that the most direct mitigation route, **reducing the number of vehicles, is rarely practicable**, since each vehicle typically serves journeys that occur at similar times or in different places and cannot be combined onto one car. With fleet consolidation foreclosed and the other mitigation pathways already constrained for rural households, these households tend to absorb the full, multiplied fuel-cost increase.

Agricultural users

What distinguishes agricultural users from ordinary car users is that fuel is **a cost of production**, not only of household mobility, and that the increase cannot be recovered downstream: as price-takers with weak bargaining power in the food chain, farmers face imperfect transmission of prices and cannot set the price of their output (Velázquez, Buffaria, & European Commission, 2017). **A rise in a production cost such as fuel therefore cannot be recovered through higher output prices and falls onto net income.**

The cost cannot be avoided quickly by switching either. Zero-emission options for on-road vehicles exist, the electric van offer now exceeds the diesel offer, and electric vans can already deliver a lower total cost of ownership than diesel equivalents (T&E, 2026), but the advantage rests on lower running costs over the vehicle's life rather than a lower purchase price, so the upfront capital remains a barrier for a cash-constrained micro-business.

Across the three subgroups, rural users face affordability pressure at every pathway: the fuel-cost impact is amplified by higher mileage and, for multi-car households, multiplied; vehicle replacement carries a higher price premium and weaker total-cost-of-ownership advantage than in urban areas; and modal shift is often unaffordable at rural frequencies. Where geography combines with income constraints, for example low-income rural households, the two affordability constraints reinforce each other.

5.2.3 Users with limited access to alternatives

For this group, ETS2 affordability pressure does not come from an income constraint or from an amplified running-cost exposure, the pass-through is uniform (see section2.2.3, Figure 2-12 and Figure 2-13), but from the inability to substitute the ICE vehicle for a lower-cost alternative under the household's actual conditions. The two cost-reduction routes that ETS2 is meant to incentivise, switching to a BEV and shifting to public transport, are structurally blocked for this group. The affordability impact is therefore the loss of these routes, and it takes a distinct form across the four subgroups.

Households in urban and peri-urban areas

For shift, night and weekend workers, the private car often remains the only feasible option for essential journeys, so the ETS2 fuel-cost signal cannot be avoided through modal substitution. Reducing car use is constrained as a cost-mitigation strategy because, where public transport is nominally available, it may not be affordable at the frequency required by atypical-hours workers, as subscription products are typically designed around standard commuting patterns (UITP, 2025). Emerging demand-responsive, shared and on-demand micro-transit solutions are being piloted in low-density areas, but as for the rural users, their per-passenger-km cost remains higher than fixed-route

public transport owing to lower density and limited economies of scale (European Commission, DG EMPL, 2024). These households therefore remain exposed to the fuel-cost signal without an affordable modal alternative.

Residents without access to home charging

For apartment dwellers and households without off-street parking, the absence of home charging removes the primary economic case for switching to a BEV. Home charging remains the most convenient and affordable way to recharge, yet the current EU framework leaves existing residential buildings largely uncovered (see section 5.4.3). Public charging can partly substitute, but **ad-hoc public charging tariffs are typically two to four times higher than domestic electricity rates**, eroding the total-cost-of-ownership advantage of a BEV for these households (BEUC, 2024). The vehicle-replacement route is therefore blocked by the structural conditions surrounding the dwelling, rather than affordability issues.

Persons with reduced mobility

For persons with reduced mobility, the vehicle-replacement route is often the most costly of all user groups, or unavailable entirely. Adapting a vehicle for wheelchair access or modified controls is already expensive, and doing so on an electric platform is harder and dearer still: battery packs mounted under the vehicle floor complicate wheelchair-accessible conversions and reduce internal space, so electric wheelchair-accessible vehicles remain few in number and more expensive than their petrol or diesel equivalents (European Mobility Group, 2026) (Energy Saving Trust, 2022). Consumers requiring modifications such as wheelchair access therefore have very few affordable electric options and a very limited range of models, which lengthens the payback period of a switch and, in many cases, removes it altogether (Energy Saving Trust, 2022). This compounds a pre-existing budget constraint, since living with a disability already raises household costs. Where publicly accessible charging is not physically usable by PRM, the shift from ICE to BEV is **not simply less economic but unavailable in practice**, an accessibility constraint examined in section 5.4.3. Modal shift offers no relief either, since where public transport is not physically accessible it cannot serve as a lower-cost alternative regardless of fare level. This subgroup is therefore doubly blocked, on both the vehicle-access and the alternatives pathways.

Self-employed users

For self-employed users of utility vehicles, affordability under ETS2 turns on how the vehicle is charged. Where a fit-for-purpose electric van is available, and the model offer now exceeds that of diesel and petrol vans, with **up to 14% lower total cost of ownership than diesel equivalents** (T&E, 2026), its running-cost advantage depends on access to low-cost depot or overnight charging. Overnight charging at a depot on a commercial contract is the cheapest channel; users without their own depot or off-street access fall back on public rapid charging, where **ad-hoc tariffs typically run two to four times domestic electricity rates** (BEUC, 2024). Reliance on costly fast-charging, combined with limited access to overnight charging, weakens the operating economics that justify the switch (ACEA, 2025). For a micro-enterprise pushed onto the public network, this differential can erode or remove the total-cost-of-ownership gain, leaving the diesel van cheaper to run and the user fully exposed to the ETS2 fuel-price signal.

Across the four subgroups, users with limited access to alternatives remain exposed to affordability risk on every transition option: the fuel-cost impact is transmitted directly, vehicle replacement is blocked by the loss of home-charging economics or by price premiums on adapted or fit-for-purpose ZEVs, and modal shift is often either unavailable at the required conditions or higher-cost per km than the private car it should replace. Where the structural absence of alternatives combines with income constraints, for example a low-income apartment dweller without home charging or a low-income PRM household, the two affordability constraints reinforce each other; where it combines with a rural or peripheral location, for example a rural PRM household, the intersection with rural users also applies.

5.3 Impacts on mobility choice / availability

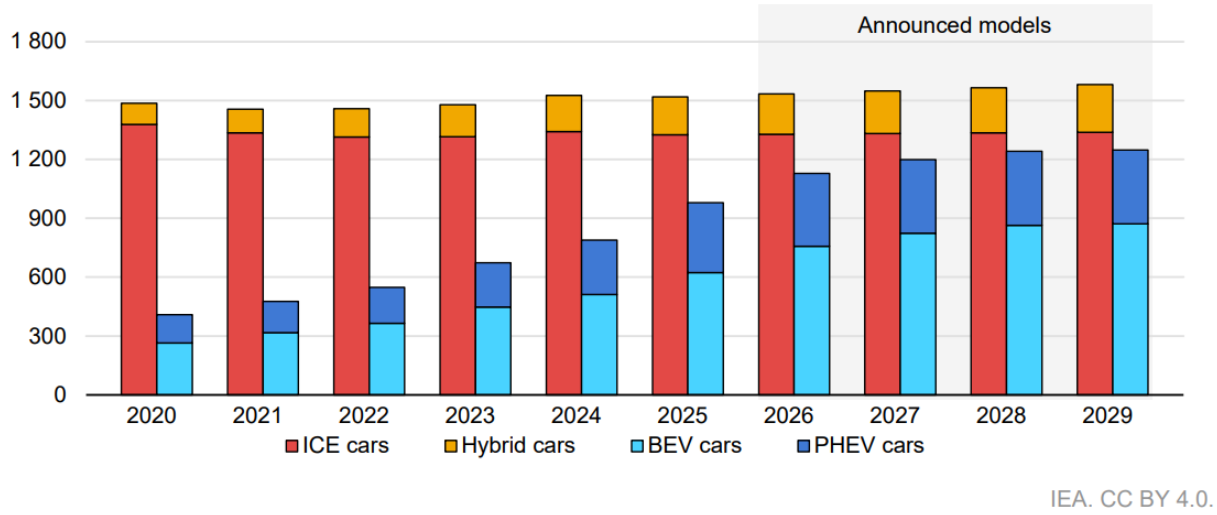
Availability captures the extent to which each group has access to alternatives to the internal-combustion vehicle. Unlike affordability, which concerns the ability to absorb higher costs, availability depends primarily on **whether viable alternative modes, services or vehicle technologies exist in the first place**.

The implications of limited availability differ across the three user groups defined in Table 5-1 because the nature of the constraint is not the same. The potential impacts of ETS2 on mobility choice are mostly indirect.

Overall, **the availability of zero-emission vehicle alternatives remains more limited than that of conventional vehicles.** BEUC reports that the supply of second-hand BEVs is still low, while small and medium-sized BEVs are only beginning to appear more visibly in dealerships. Large corporate fleets are expected to play an important role in expanding the used-BEV market because they release vehicles after relatively short ownership periods (BEUC, 2025). This constraint is reflected in the composition of the vehicle fleet: **electrically chargeable vehicles represented only 3.7% of the EU passenger-car fleet in 2024,** suggesting that the future stock of used BEVs is still being built from a relatively small base (ACEA, 2026).

The availability of new BEV alternatives is improving, but the choice set remains narrower than for conventional vehicles. The IEA reports that Europe still offered fewer BEV than ICE models in 2024 and that the available BEV offer remained concentrated in larger and higher-end segments (IEA, 2026). Figure 5-6 illustrates that, although BEV model availability is expected to grow rapidly over the remainder of the decade, ICE vehicles are projected to remain available in larger numbers. Europe nevertheless recorded the fastest growth in electric vehicle model availability among the three major EV markets in 2025 (IEA, 2026). **T&E expects at least 19 additional affordable BEV models to enter the European market by 2027**, indicating that the range of available alternatives is likely to expand further in coming years (T&E, 2025).

Figure 5-6. Number of car models available worldwide by powertrain, 2020-2029



Source: Global EV Outlook 2026: Growing sales amid an energy crisis (IEA, 2026)

Notes: ICE = internal combustion engine; BEV = battery electric vehicle; PHEV = plug-in hybrid electric vehicle. Future model availability is based on EV launch announcements and the extrapolation of historic ICE and hybrid electric vehicle model availability trends.

5.3.1 Vulnerable users

Under availability for vulnerable users, the central question is whether a realistic, lower-carbon alternative to continued ICE use actually exists for these households. Two drivers determine this:

- the availability of an affordable second-hand BEV market,
- and the availability of viable non-car alternatives, the absence of which produces "forced" car dependence.

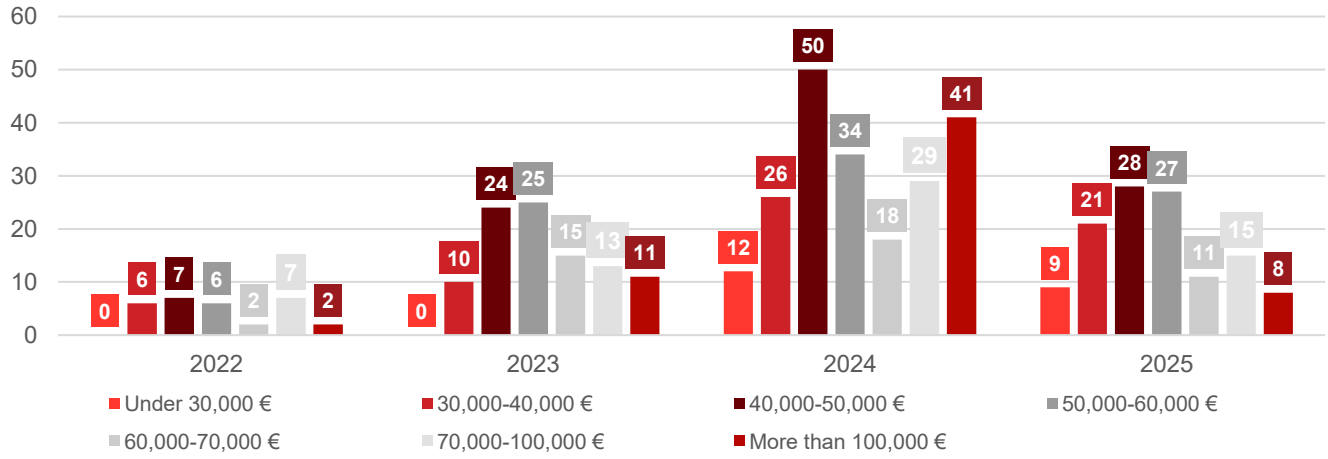
Both drivers apply across the two vulnerable subgroups, but with different emphasis. For low-income households reliant on an ICE vehicle for essential mobility, the binding constraint is the availability of an affordable second-hand BEV, since the used market is their only realistic route to a cleaner vehicle. For households already in transport poverty, the binding constraint is the availability of viable alternatives to the car, since mobility already absorbs a disproportionate share of their income. Where neither a suitable affordable BEV nor a viable alternative to the car is available, these households cannot escape the ETS2 fuel-cost signal by switching vehicle or mode.

Availability of an affordable second-hand BEV market

For vulnerable users, a used BEV is usually the only realistic route to a zero-emission vehicle. While **almost eight in ten EU citizens buy cars second-hand, around 96-100% of low- and middle-income groups rely on the used market**, so the availability of used BEVs largely determines whether a zero-emission option is realistically within reach (T&E, 2023). Although this option exists in principle, it remains thin in practice. The second-hand EV market is still immature relative to the used ICE market: in 2023, **used EV sales reached only around 450,000 units across France, Germany, Italy, Spain, the Netherlands and the UK combined, against roughly 30 million used ICE vehicles in the same countries**, and used EVs represented approximately 5% of the global used-car market, projected to rise to 20-30% by 2034 (Diouf, 2025).

Because today's new cars become tomorrow's used stock, the composition of new-model supply shapes the future affordable used market, and this pipeline is skewed towards higher price segments. **EAFO data show that no new battery-electric model priced below €30,000 was available before 2024, and only 12 such models appeared in 2024 and 9 in 2025, while new-model availability expanded far more rapidly in the €40,000-60,000 and premium brackets over the same period** (EAFO, 2026). New-model supply is therefore growing predominantly where vulnerable households cannot buy, leaving the affordable segment that would eventually feed the second- and third-hand market limited. Figure 5-7 shows the number of new electric models introduced by price bracket and year.

Figure 5-7. Available new electric models per price bracket, per year (2022-2025)



Source: WSP elaboration from (EAFO, 2026) data.

As a result, even where a household would benefit economically from switching away from fossil fuels, a suitable and affordable second-hand BEV may simply not be available, leaving continued ICE use, and direct exposure to ETS2 fuel costs, as the only realistic option (BEUC, 2025).

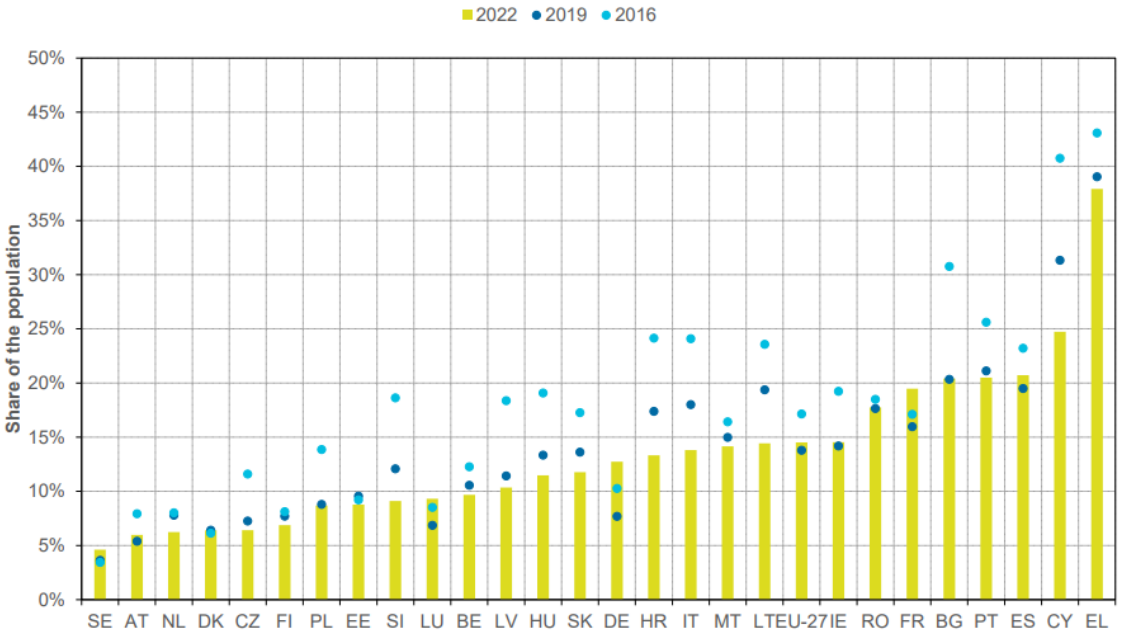
Availability of viable alternatives to the car

The share of the population that is materially and socially deprived and owns a car is often used as an indicator of potential "forced car ownership". The concept does not imply that deprived households should not own a car, nor that ownership is itself evidence of hardship. It describes a situation in which households on low incomes maintain a private vehicle, and bear its cost, because no viable alternative exists for reaching employment, education, healthcare and other essential services (European Commission, DG EMPL, 2024). Material deprivation combined with car ownership does not by itself prove that ownership is forced: it indicates potential car dependence, which becomes a forced-ownership situation only where public transport and other mobility options are limited or unavailable.

Interpreted with this caveat, Figure 5-8 shows that **around 15% of the EU population was materially and socially deprived and owned a car in 2022** (European Commission, DG EMPL, 2024). This suggests that a significant share of deprived households retain a car despite financial pressure. The European Commission explicitly interprets high values of this indicator as potentially reflecting limited transport options, including less dense public transport networks and fewer active-mobility alternatives, particularly in rural areas (see section 5.3.2) (European Commission,

DG EMPL, 2024). Where a household depends on a car because no viable alternative is available, it can neither reduce car use nor readily switch mode in response to higher fuel costs and is therefore among the least able to escape the ETS2 price signal, which passes through directly to its essential mobility.

Figure 5-8. Share of the population that is materially and socially deprived and owns a car



Source: DG EMPL and Oeko-Institut calculations based on EU-SILC microdata (European Commission, DG EMPL, 2024))

Notes: Full details of the calculations and results are provided in the source.

Across both subgroups, these availability constraints mean that realistic alternatives to ICE use, whether an affordable used BEV or a viable non-car option, are often not available. This increases the risk of continued dependence on road-fuel consumption under ETS2 and reinforces the affordability pressures analysed in section 5.2.1.

5.3.2 Rural users

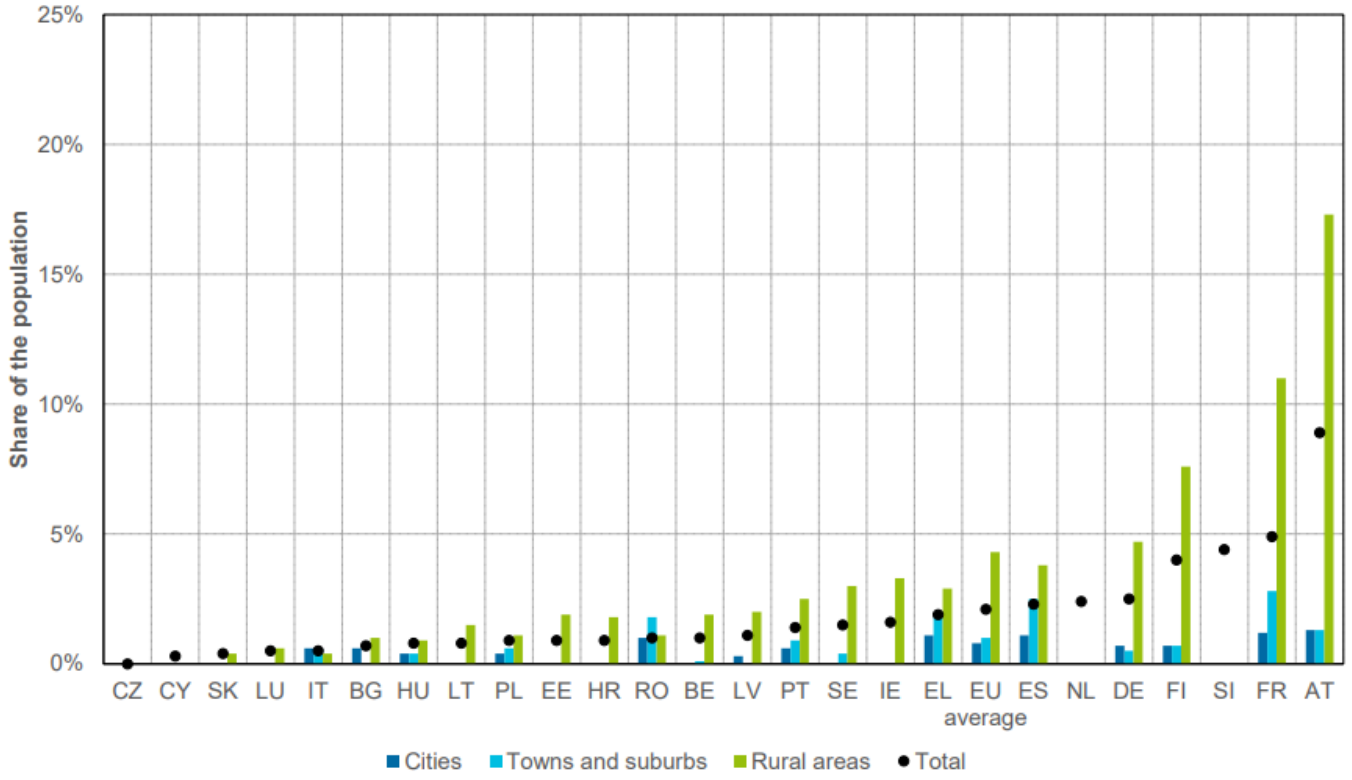
Rural and remote peri-urban households

- Availability of public transport in rural areas

Public transport alternatives are often the weakest component of the rural mobility choice set. Low population density, dispersed activity patterns and long travel distances make it more difficult to provide frequent and financially viable public transport services. Reflecting these challenges, the Interreg Europe Rural Mobility project estimates that **129 million EU citizens live in sparsely populated areas with poor or non-existent public transport services,** where dependence on private cars is common (Interreg Europe, 2026).

The European Commission similarly finds that rural residents are substantially more likely than urban residents to report that the nearest public transport stop is "too far away" (European Commission, DG EMPL, 2024). As shown in Figure 5-9, the share of the population reporting this barrier was consistently higher in rural areas across most Member States in 2014. On average, around **4.5% of the rural population in the EU report that the nearest public transport stop is too far away**, with considerably higher shares observed in some Member States, including Austria (around 17%), France (around 11%) and Finland (around 8%).

Figure 5-9: Share of the population for which the nearest public transport stop is “too far away” by degree of urbanisation, 2014



Source: Calculations based on EU-SILC 2014 microdata ad-hoc module “Material deprivation” (European Commission, DG EMPL, 2024)

Notes: Full details of the calculations and results are provided in the source.

- Availability of suitable low-emission vehicles

Suitable-range electric vehicles are available, but the affordable segment does not yet meet rural distance requirements. EAFO data show that battery-electric models offering longer range are on the market, yet range and price move together: at a purchase price below EUR 30,000, **no available BEV exceeds around 341 km of range** (EAFO, 2026). For rural users, whose longer daily and professional journeys make range a binding requirement, the models that meet their needs therefore sit above the price range accessible to many households. The constraint is not the absence of a long-range vehicle, but the absence of an affordable one that also meets rural range needs.

Multi-car households

There is no distinct availability constraint that applies specifically to multi-car households. Their reliance on more than one vehicle results from the limited availability of viable alternatives in rural and remote peri-urban areas, addressed above. The household-level effect, where a second vehicle is required to maintain access to simultaneous and geographically dispersed activities, is examined under physical accessibility.

Agricultural users

For agricultural users, a viable zero-emission alternative depends on whether a vehicle capable of performing the required on-road task is available. For farm vans and light utility vehicles, the offer is now broad: buyers have access to more electric van models than conventional ones on the EU market (T&E, 2026). For heavier on-road needs the choice is narrower, only a small number of fully electric pick-ups are on sale in Europe, against dozens of diesel options (ElectricFleet, 2026). Adoption is further constrained in rural settings by limited and unreliable charging infrastructure and grid capacity, identified as a central barrier to electrifying farm operations (Machine Edge Global, 2025). Availability for this group therefore depends mostly on whether the electric vehicle can perform the required task and be charged reliably at the farm.

As a result, the availability of a suitable alternative depends on the operation. For light tasks, a zero-emission option may exist; for high-power, long-duration fieldwork, no equivalent battery-electric machine is yet available, and diesel remains the only practicable option. Alternative fuels and powertrains for agricultural machinery continue to face constraints related to availability, cost, infrastructure and technical suitability, particularly for high-power applications. Diesel engines are therefore expected to remain important in off-highway machinery, prolonging agricultural users' exposure to ETS2-related fuel-cost increases where fossil diesel use falls within its scope (Agritechnica, 2025) (Agritechnica, 2025). The practical accessibility of charging for road vehicles used in agricultural activity is examined separately under physical accessibility (see section 5.4.25.4.2).

5.3.3 Users with limited access to alternatives

Households in urban and peri-urban areas

The presence of an urban or peri-urban public transport network does not ensure that a suitable service is available for every journey. Households may lack a viable alternative to private driving where services do not operate during early-morning, night-time, weekend or shift-change periods, where frequencies are too low to support time-sensitive journeys, or where routes do not connect residential areas with required employment and service destinations. Night-time mobility requires specific planning because travel demand, activity locations and operating conditions differ from daytime patterns, while night services play an important role in supporting essential workers and inclusive urban mobility (UITP, 2026). The European Commission identifies public transport as central to territorial accessibility, social inclusion and connectivity between urban and peri-urban areas, and emphasises the need to adapt infrastructure and services to users' needs (European Commission, 2026). Where no service is offered at the required time or for the required origin-destination pair, public transport is unavailable as a practical substitute for private driving. Affected households may therefore remain dependent on ICE vehicles and exposed to ETS2-related fuel-cost increases.

Residents without access to home charging

The availability of electric vehicles does not provide a viable alternative to an ICE vehicle where households lack a residential charging option. This constraint particularly affects residents without private parking and households in multi-unit buildings where parking spaces are not equipped or prepared for charging. Evidence from France illustrates the resulting difference: in 2022, **88% of EV owners living in houses charged mainly at home, compared with 49% of EV owners living in apartments** (ICCT, 2024).

Where home charging is unavailable, residents must rely more heavily on public infrastructure. This can make an electric vehicle a less practicable substitute for an ICE vehicle, particularly where regular residential charging cannot be replicated through the public network. The absence of a home-charging option may therefore limit the availability of a viable zero-emission alternative and sustain dependence on fossil-fuelled vehicles.

Persons with reduced mobility

For persons with reduced mobility, the availability of a viable public transport alternative depends on whether the transport system provides a service that can serve their journey. **Around 87 million people in the EU have some form of disability** (European Commission, 2026), and most mobility services are not barrier-free, which limits the effective supply of usable options for this group (LEVA EU, 2025). The European Commission notes that, beyond physical barriers, persons with disabilities face challenges relating to service availability, including limited-hour services and options that must be pre-booked well in advance, which forces many to rely on assistance or restricted transport options (European Commission, 2026).

A central availability gap is that an accessible service is not systematically provided across many networks. The European Disability Forum notes there are no EU-wide rules on the accessibility of urban transport vehicles and infrastructure, metros, light rail, trams and bus stops, producing a patchwork of national, regional and local solutions in which some authorities still procure new buses and build stops without accessibility built in (European Disability Forum, 2025). As a result, provision of a genuinely accessible mainstream service is uneven from one network to the next. Where such a service is not provided, demand-responsive transport can offer an alternative, since it operates in response to bookings rather than fixed routes and has historically been used to widen opportunities for people with limited mobility and those who are socially marginalised (Interreg Europe, 2018).

However, such services are not consistently available across the EU. As stated in section 5.3.2, around 129 million EU citizens live in sparsely populated areas with poor or non-existent public transport, leaving groups who cannot drive, including disabled residents, with few options (Interreg Europe, 2026). EU-funded work continues to treat the

availability of accessible, demand-responsive and shared mobility services in underserved regions as an unresolved gap requiring further development (European Commission - CORDIS, 2025).

Where neither an accessible mainstream service nor a dedicated accessible alternative is provided for the required journey, the effective supply of viable public transport options for persons with reduced mobility is narrower than the overall network suggests. Affected users may remain dependent on private vehicles and consequently exposed to ETS2-related fuel-cost increases. The physical usability of stops, stations, vehicles and public chargepoints is examined separately under physical accessibility

Self-employed users

Self-employed users reliant on diesel vans depend on the availability of a zero-emission vehicle capable of meeting their operational requirements. Model availability has improved substantially: electric light commercial vehicles reached around **11% of the EU market in 2025, registrations grew by 68% in a single year, and buyers now have access to more electric van models than conventional ones** (T&E, 2026). Even so, uptake remains constrained by gaps in the practical suitability of the available offer, with fleets reporting difficulty finding a model that fits their needs, higher prices than diesel equivalents, and concerns around loading space and range (FleetEurope, 2024)

Availability is also shaped by whether the vehicle can perform the required task. Payload, cargo volume, towing capacity and usable range determine suitability for a given trade, **and real-world range falls below the official WLTP figure under cold weather, heavy payloads and hilly terrain, which matters for operators running to a fixed daily schedule** (Auto Capital, 2025). Where a self-employed user's operational profile requires long daily distances, heavy loads or towing, the subset of genuinely suitable models is narrower than the headline number of available models suggests.

A further availability constraint concerns the charging infrastructure required to operate these vehicles. Electric vans are larger than cars and **require tailored charging infrastructure with adequate space**, which remains scarce on the public network (FleetEurope, 2024). UK research on commercial electric vans found that operators without a back-to-depot model expected to depend on public charging, that en-route chargepoints were the main daytime charging location reported, and that **public chargepoints could be difficult to find, out of service, too small for large vans or associated with long waiting times** (UK Government, 2024).

Where a suitable zero-emission utility vehicle is unavailable for the required task, or where the charging infrastructure needed to operate it is not provided, self-employed users may be unable to substitute their diesel van. In these circumstances they remain dependent on fossil-fuelled vehicles and exposed to ETS2-related fuel-cost increases. The practical accessibility of charging along professional routes is examined separately under physical accessibility in section 5.4.3.

5.4 Impacts on physical accessibility

Physical accessibility refers to the ability of individuals and households to reach essential services and activities within a reasonable travel time and to use the transport infrastructure available to them (European Commission, 2025). Whereas affordability concerns the cost of mobility options and availability concerns their existence, physical accessibility concerns whether these options can realistically be reached and used in practice. Accessibility constraints may persist even where transport and mobility solutions are both available and affordable.

This section examines three dimensions of physical accessibility across the user groups defined in Table 5-1 :

- **Distance-related constraints**, including access to employment, healthcare, education, public transport and charging infrastructure;
- **Physical barriers**, such as inaccessible vehicles or public transports, stations and charging points; and
- The spatial distribution and accessibility of **charging infrastructure**.

5.4.1 Vulnerable users

Income alone does not create a distinct physical accessibility constraint, but it can restrict the effective use of otherwise accessible transport. Low-income households reliant on private ICE vehicles may remain geographically connected to employment, healthcare, education and other essential activities while having limited capacity to undertake the journeys required to reach them. This risk is particularly relevant to households already experiencing transport poverty, where mobility costs or inadequate transport options hinder access to essential services, employment and participation in society (European Parliament, 2022) (JRC, 2022) (European Commission, 2025). ETS2-related fuel-cost increases may reinforce this constraint where essential journeys cannot be shortened or shifted to another mode, reducing the range or frequency of activities that households can effectively reach.

5.4.2 Rural users

Rural areas are home to around 25% of the European population and cover 83% of EU territory. Dispersed settlement patterns, reduced transport connectivity and limited access to public services can restrict residents' access to essential activities (European Parliament, 2025). Physical accessibility impacts differ across the three rural subgroups considered in Table 5-1:

- Rural and remote peri-urban households may face longer distances to essential destinations, weaker transport-network performance, impractical public transport connections and poor spatial access to public charging;
- Multi-car households may require more than one vehicle to maintain access to simultaneous and geographically dispersed activities;
- Agricultural users may face long and dispersed professional journeys, while public charging may not be conveniently accessible from farms, operational destinations or required routes.

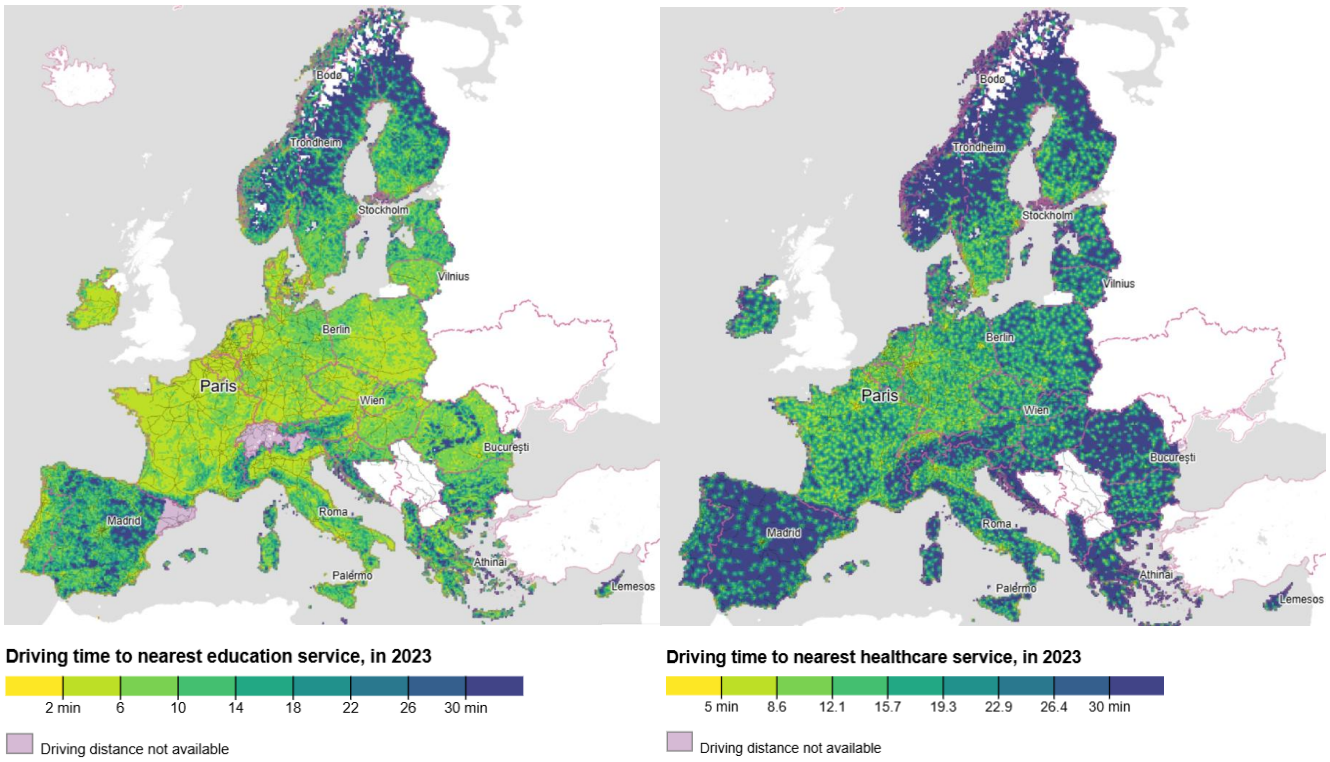
ETS2 does not create these geographical constraints. It increases the cost of the fossil-fuelled mobility on which rural users continue to depend where those constraints prevent shorter journeys, modal substitution or vehicle switching.

Rural and remote peri-urban households

- Geographical accessibility of essential services

Rural and remote peri-urban residents generally need to travel further to reach employment, healthcare, education, retail and other essential services. Low population density can reduce the range of services supported locally and increase the distance residents must travel to reach them. Figure 5-10 illustrates the resulting spatial variation in road accessibility: estimated driving times to the nearest healthcare and primary education services differ considerably across Europe, with longer times visible in many sparsely populated and peripheral locations (Eurostat - GISCO, 2026). The European Parliament identifies reduced transport connectivity, limited public services and restricted access to major markets among the structural challenges facing rural areas (European Parliament, 2025). The Commission Recommendation on transport poverty similarly recognises that transport enables access to employment, healthcare and education, and that limited transport access can contribute to social exclusion (European Commission, 2025).

Figure 5-10. Estimated driving time to nearest basic service (left: education; right: healthcare) in 2023



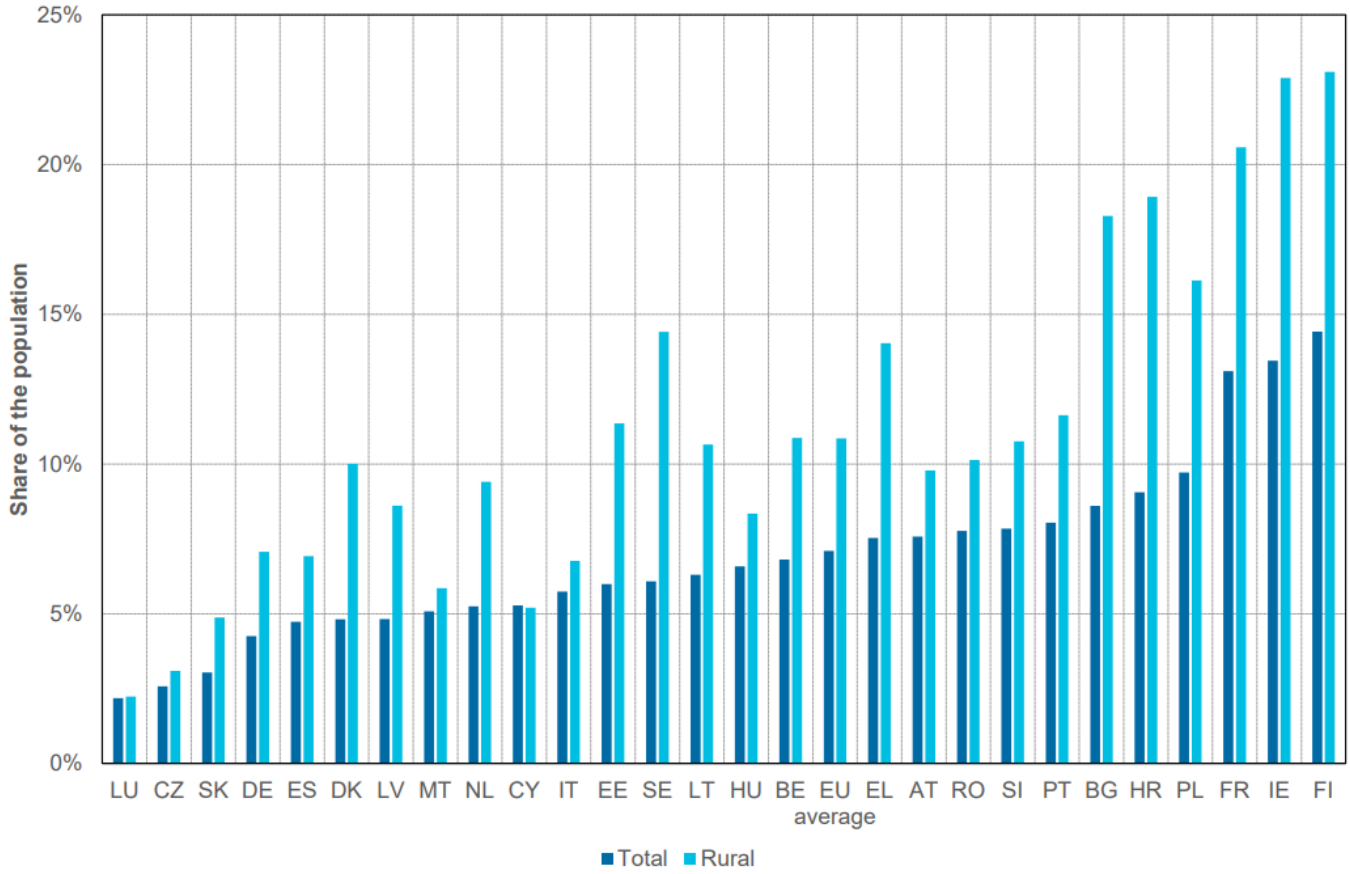
Source: Accessibility maps from (Eurostat - GISCO, 2026)

- Practical accessibility of public transport

Evidence presented in Figure 5-11 shows that the proportion of people reporting very difficult access to public transport is higher among rural residents than among the total national population in every covered Member State except Cyprus (European Commission, DG EMPL, 2024). Based on the country values reported in the figure, the EU average across is approximately **11% for rural residents, compared with around 6% for the total population**.

Figure 5-11: Share of the population with “very difficult” access to public transport for the total and rural population, 2016

46 househol



Source: Calculations based on Eurofound 2016 European Quality of Life Survey microdata (European Commission, DG EMPL, 2024).

Notes: Full details of the calculations and results are provided in the source.

Rural and remote peri-urban households therefore face a combined accessibility constraint: **essential destinations are more geographically dispersed, while the public transport services required to reach them may be difficult to access or impractical to use**. First- and last-mile gaps can reinforce this constraint. A regional bus or rail service may connect a rural area with an urban centre, while residents of dispersed settlements still face difficulty reaching the nearest stop or station, making the complete journey impractical without an additional connecting mode. Interchange, waiting and access times may also make employment, healthcare and other essential activities impractical to reach, even where a transport connection formally exists. Excessive total journey times can therefore create transport-related time poverty and restrict participation in essential activities (European Commission, DG EMPL, 2024) (European Parliament, 2022). The European Commission identifies mobility hubs, demand-responsive services and connections between public transport, shared mobility, cycling and walking as measures to improve rural accessibility (European Commission, 2025).

- Access to surrounding opportunities.

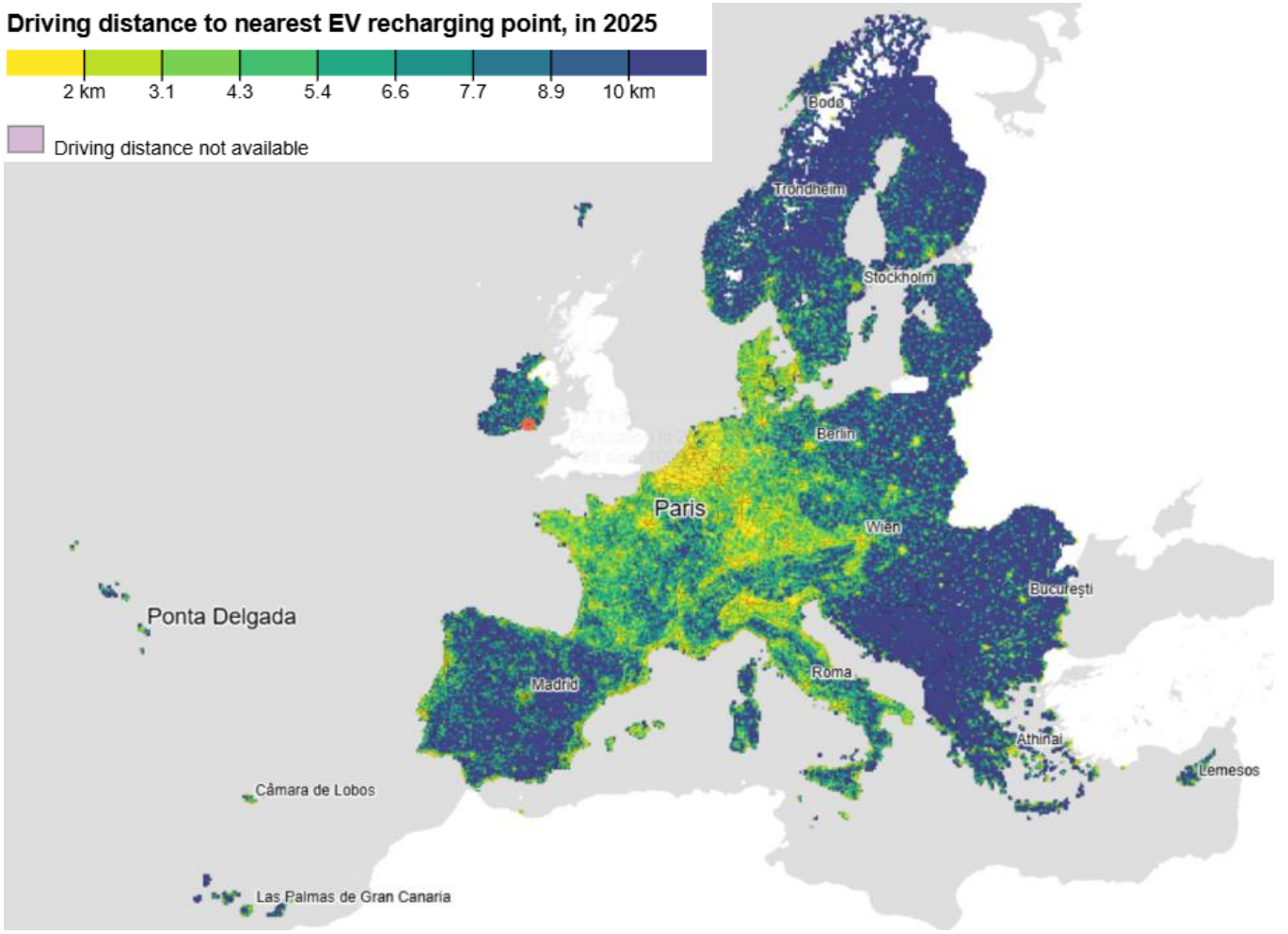
Rural accessibility also depends on how many destinations and opportunities can be reached within a reasonable travel time. The Commission’s accessibility framework distinguishes between proximity, defined as the number of destinations within a fixed distance, and accessibility, defined as the number of destinations that can be reached within a fixed period. Transport performance compares the population that can be reached with the population located nearby and therefore can give indications on how effectively the transport network connects residents to surrounding opportunities (European Commission, 2025). The analysis reproduced by the Social Market Foundation shows that drivers in EU villages and dispersed rural areas can reach a smaller share of the population located within a 120 km

radius during a 90-minute journey than drivers in cities. **At EU level, the indicated shares are approximately 64% to 68% for villages and dispersed rural areas, compared with around 86% for cities** (Social Market Foundation, 2025). The results indicate weaker road-network connectivity in rural areas even where residents have access to a car.

- Spatial accessibility of public charging.

Rural households seeking to switch to an electric vehicle may face an additional accessibility constraint where private charging is unavailable. These households depend more heavily on public infrastructure, but national or regional charger availability does not ensure convenient access from their residence, essential destinations or required routes. Public charging infrastructure is concentrated in a small number of Member States. Of the EU's 632,423 public charging points at the end of 2023, the Netherlands accounted for 22.8%, Germany for 19.1% and France for 18.9%, **meaning that these three countries together hosted around 61% of the EU total** (ACEA, 2026). Even though these national totals do not measure local accessibility, they still illustrate concentration between Member States. Figure 5-12 complements them by showing how driving distance to the nearest public recharging point varies within and between countries.

Figure 5-12. Estimated driving time to nearest basic EV recharging point in 2025



Source: Accessibility maps from (Eurostat - GISCO, 2026)

The map shows extensive areas in the lower distance bands across France, the Benelux countries and much of Germany. Longer distances are more prevalent across parts of the Nordic countries, Spain and Portugal, eastern and south-eastern Europe, and several peripheral and island territories (Eurostat - GISCO, 2026). **In some poorly served locations, the nearest public charger may be more than 50 km away** (Social Market Foundation, 2025).

Although the figure does not formally distinguish rural from urban areas, the pattern illustrates the type of spatial coverage constraint that may affect residents of dispersed and peripheral locations. Public infrastructure may therefore exist within a country or region without being conveniently accessible from rural residences, essential destinations or required routes. For rural households without private charging, longer access distances may reduce the practical feasibility of switching from an ICE vehicle to an electric vehicle and prolong dependence on fossil-fuelled mobility. The Eurostat indicator captures driving distance to the nearest recorded public recharging point but does not account for the number of connectors, charging power, operational status, occupancy, price or vehicle compatibility. These factors may create additional constraints even where a charger is geographically close (Eurostat - GISCO, 2026).

Multi-car households

Car access can enable economic and social participation where public transport and other mobility options are constrained (van Dülmen, Simon, & Klarner, 2022). At household level, these conditions may increase the practical importance of access to more than one vehicle. Different household members may need to reach separate destinations at overlapping times, making journeys difficult to combine, reschedule or transfer to public transport. In such circumstances, a second vehicle may enable household members to maintain independent access to employment, education and essential services.

ETS2 may increase the cost of operating both vehicles. Reducing use of the second vehicle could lower fuel expenditure while restricting access to activities where journeys occur at similar times or in different locations. **The physical-accessibility effect therefore concerns the destinations household members can reach when the second vehicle is unavailable or used less frequently.**

Agricultural users

Agricultural activity depends on transport links connecting farms with other stages of the supply chain, including processing, storage, distribution and markets (Agriculture.Institute, 2025). For agricultural users in rural areas, the accessibility implications of electrification therefore concern whether charging infrastructure can be reached from farms and incorporated into professional road journeys. Rural charging requires infrastructure planning that reflects local travel patterns, charging needs and the dispersed character of rural activity, while European charging networks remain unevenly distributed geographically (EAFO, 2024). Public charging concentrated near population centres or principal roads may consequently be less practical for activities originating in more remote agricultural locations.

5.4.3 Users with limited access to alternatives

Users with limited access to viable alternatives face practical or infrastructural barriers that prevent formally available transport modes and zero-emission mobility options from being used under realistic conditions. These constraints can arise independently of income or location: an alternative may exist in principle while remaining inaccessible at the time, place or in the form required by the user. Accessibility impacts for this group arise from three related constraints:

- Public transport may be geographically present but fail to provide access to essential activities at the times required
- Residents of multi-unit buildings or households without private parking may lack practical access to home charging;
- Public transport and public charging infrastructure may be physically hard to use, specifically for persons with reduced mobility.

Households in urban and peri-urban areas without a viable PT network

Public transport may be geographically present without providing effective access to employment and other essential activities at the required time. Public transport accessibility has both spatial and temporal dimensions, and routes, stops and timetables may not correspond adequately to users' travel needs (Żochowska, Kłos, Soczówka, & Pilch, 2022). Around 29 million employees, representing **17.7% of employees aged 15 to 64 in the EU-27, work shifts**, indicating the potential scale of journeys undertaken outside conventional commuting periods (Bermúdez & Desiere, 2022). UITP also identifies shift and night workers as a group that typically experiences difficulty accessing public transport and indicates that extending operating hours and providing night services can improve their access (UITP, 2026). Where services are unavailable or insufficient during night-time, weekends or shift-change periods, the

underlying operating-hour or frequency gap is primarily an availability constraint. However, it also creates a temporal accessibility impact because affected users cannot reach employment or other essential activities when access is required. The European Commission's transport-poverty framework reflects this temporal dimension by including peak and off-peak public transport travel times and the number of destinations reachable within a specified travel-time threshold among potential accessibility indicators (European Commission, 2025). Where timetables do not correspond to required travel schedules, public transport does not provide a practicable alternative to private driving.

Residents without access to home charging

In 2024, **48% of the EU population lived in a flat**, ranging from 10% in Ireland to 65% in Spain. The share was particularly high in cities, where 73% of the population lived in flats (Eurostat, 2025). These figures do not directly measure access to private charging, but indicate the potential scale of dependence on charging arrangements adapted to multi-unit buildings.

Even where apartment dwellers have access to a parking space, obtaining a usable private charging connection may be constrained by inadequate electrical infrastructure, the physical relationship between parking spaces and the building's electricity supply, collective decision-making and procedures for approving installations. The recast Energy Performance of Buildings Directive requires pre-cabling in new residential buildings and buildings undergoing major renovation, but largely leaves the existing residential building stock outside these requirements (ICCT, 2024). Measures applied in some countries, including technical consultation support, collective installation arrangements and right-to-plug provisions, illustrate how these barriers can be addressed, but they are not consistently established across Member States (ICCT, 2024) (T&E, 2025).

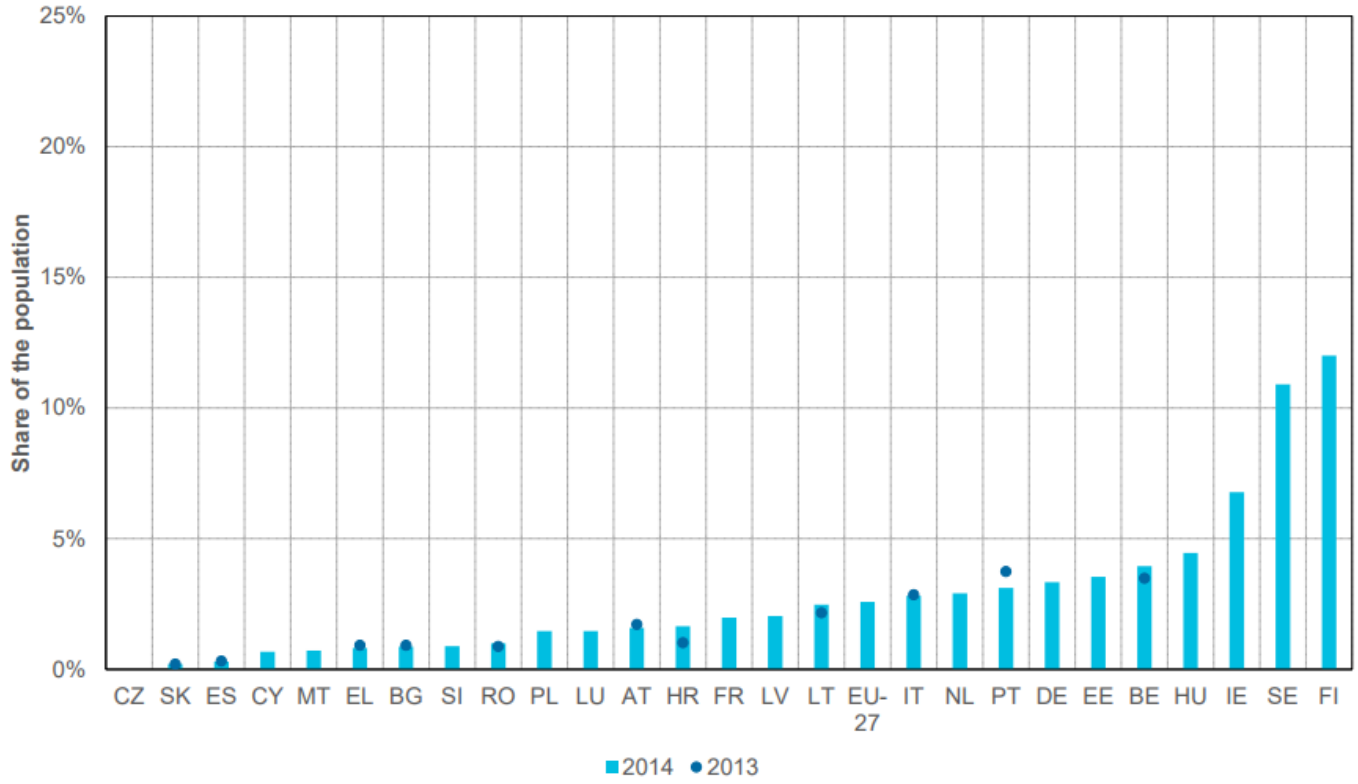
Where residents cannot secure a usable charging connection at or near their dwelling, the presence of electric vehicles on the market does not provide a practicable alternative to an ICE vehicle. The constraint is therefore the resident's practical access to the infrastructure required to use one under normal residential conditions.

Persons with reduced mobility

For persons with reduced mobility, formally available public transport and charging infrastructure may remain physically inaccessible or independently unusable.

Public transport may be present but remain physically unusable for some PRM users. The European Disability Forum reports gaps in the EU framework governing the accessibility of urban transport vehicles and infrastructure, including metros, light rail, trams and bus stops, and notes that newly procured urban buses may still lack necessary accessibility features (European Disability Forum, 2025). EU-SILC evidence also identifies substantial difficulty in accessing public transport among PRM in several Member States, although the prevalence and geographical pattern vary by country. As shown in Figure 5-13, around **2.5% of the EU PRMs reported that access to public transport was too difficult in 2014**, with substantially higher shares observed in Finland (around 12%), Sweden (around 11%) and Ireland (around 7%) (European Commission, DG EMPL, 2024). Where stops, stations or vehicles cannot be used independently, public transport does not constitute a practicable alternative to private driving.

Figure 5-13. Share of the population with too difficult access to public transport for persons with reduced mobility

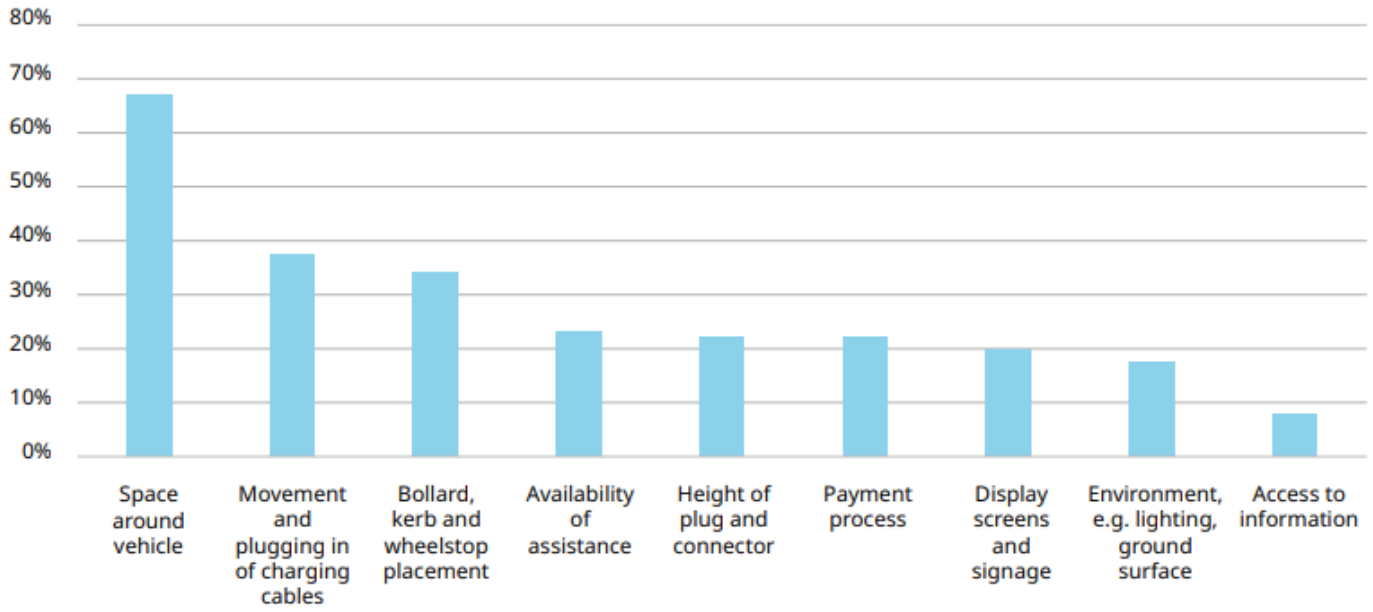


Source: Calculations based on the EU-SILC 2013 microdata ad-hoc module 'Wellbeing' and the EUSILC 2014 microdata ad-hoc module 'Material deprivation' (European Commission, DG EMPL, 2024).

Notes: Full details of the calculations and results are provided in the source.

Physical accessibility barriers can also constrain vehicle substitution. The presence of a nearby public chargepoint does not guarantee that persons with reduced mobility can operate it independently. A UK survey of users with accessibility needs identifies insufficient space around vehicles as the most frequently reported problem, followed by difficulties moving and connecting charging cables, payment processes, the positioning of bollards, kerbs and wheel stops, and inaccessible displays or connectors.

Figure 5-14. Challenges and issues at public chargepoints - wheelchair user respondents (n = 91)



Source: (Motability Foundation, 2025)

Among the 91 wheelchair-user respondents presented in Figure 5-14, approximately two-thirds reported insufficient space around the vehicle, **more than one-third reported difficulties moving and connecting charging cables, and approximately one-third identified the positioning of bollards, kerbs and wheel stops as a barrier** (Motability Foundation, 2025). The sample is relatively small and UK-based, so the results should be treated as indicative of the types of barriers experienced rather than representative of all persons with reduced mobility in the EU. Nevertheless, the findings demonstrate that geographical proximity to a chargepoint does not ensure its independent usability. Where these design barriers prevent use, public charging does not provide an accessible electric-vehicle alternative.

Self-employed users

For self-employed users, the principal constraint is often the availability and operational suitability of zero-emission utility vehicles, including their range, payload and recharging requirements. These issues are addressed primarily under availability in 5.3.3. However, an accessibility constraint may also arise where charging infrastructure cannot be conveniently reached or used during professional journeys. Operators without a back-to-depot model depend on public charging during the working day, and public chargepoints can be difficult to find, out of service or subject to long waits (UK Government, 2024).

Self-employed users may undertake variable routes connecting customers, worksites, suppliers and storage or maintenance facilities. **A public chargepoint may therefore exist within the wider area without being accessible from the locations and routes required during the working day.** Public charging sites may also be impractical for some utility vehicles where access arrangements, parking-bay dimensions or site layouts do not accommodate the vehicle or its operational use. In such circumstances, the issue is whether charging infrastructure can be accessed and incorporated into required working journeys without preventing the completion of professional activities.

5.5 Summary of findings

The Table 5-3 below synthesises the findings of the preceding analysis, showing how ETS2 affects each user group across the three dimensions of affordability, mobility choice and physical accessibility. It highlights the main source of vulnerability in each case and how the nature of the impact differs across user groups.

Table 5-3. Summary of ETS2 impacts across user groups and mobility dimensions

User group	Affordability	Mobility choice / availability	Physical accessibility
Vulnerable users	ETS2 raises fuel costs for households with the least capacity to absorb them or respond. Low-income ICE users often rely on older, less efficient vehicles, while the upfront cost of a ZEV, constrained finance, a thin affordable second-hand BEV market and potentially costly public transport restrict both vehicle switching and modal shift. The illustrative analysis confirms that lower-income quintiles face the highest estimated fuel-expenditure burdens, particularly in Poland and Greece, even though country-quintile averages remain below the indicative 6% threshold.	The central constraint is the limited supply of realistic alternatives under the conditions relevant to vulnerable households. The affordable second-hand BEV market remains small because lower-priced new BEVs have entered the market only recently, while households in transport poverty may also lack a viable non-car option. Where neither an affordable used BEV nor suitable public, shared or active transport is available, continued ICE use becomes the only realistic mobility choice.	Low income does not itself create a distinct physical-accessibility barrier. However, vulnerable households are more exposed where essential destinations are distant, public transport is difficult to reach or use, or charging cannot be accessed at home. In these circumstances, higher fossil-fuel costs interact with existing spatial and infrastructural barriers, reducing effective access to employment, healthcare, education and other essential activities.
Rural users	Geography amplifies the affordability impact through longer journeys and more intensive reliance on private vehicles. The pressure can multiply across multi-car households, while compatible longer-range or higher-payload ZEVs require greater upfront capital and rural alternatives may be costly at the frequency required. For agricultural users, ETS2-related road-fuel costs also affect business activity and may reduce net income where higher input costs cannot be recovered through output prices.	Rural mobility choice is constrained principally by weak public transport provision and the limited supply of vehicles suited to rural operating conditions at accessible prices. Poor or non-existent services sustain car dependence, while affordable BEVs may not meet longer-range requirements. Electric vans serve many light agricultural tasks, but the choice of electric pick-ups for heavier on-road requirements remains narrower. Multi-car households have no separate availability constraint: their reliance on several vehicles follows from these underlying rural service and vehicle gaps.	Dispersed destinations, long travel times and first- and last-mile gaps restrict the employment, services and opportunities rural residents can reach, even where a formal transport connection exists. Public charging may also be too distant from homes, farms, operational destinations or required routes to support vehicle switching. Multi-car households may lose independent access to simultaneous activities if use of the second vehicle is reduced, while agricultural users may struggle to incorporate charging into dispersed professional journeys.
Users with limited access to alternatives	The central affordability impact is the loss of cost-reduction pathways rather than lower income or greater fuel consumption. Shift workers may lack an affordable modal substitute; households without home charging and self-employed van users may face public charging costs that erode the ZEV total-cost advantage; and persons with reduced mobility may face costly adapted vehicles alongside unusable public transport or charging. These users therefore remain exposed to ICE running costs because switching vehicle or mode is uneconomic under their actual conditions.	Alternatives may exist in headline terms while remaining unavailable for the required use. Public transport may not operate at the times or between the locations required by shift workers; residents without private parking may lack residential charging; persons with reduced mobility may not be offered an accessible mainstream or dedicated service; and self-employed users may not find a zero-emission van and charging arrangement that meets range, payload, towing or working-day requirements. These gaps leave affected users dependent on fossil-fuelled vehicles.	Formally available alternatives may remain impossible to use under real conditions. Timetables may not provide access to work during night or shift hours; apartment residents may be unable to secure a usable charging connection; persons with reduced mobility may face inaccessible stops, vehicles, charging bays, cables or controls; and self-employed users may be unable to reach or accommodate suitable charging along professional routes. Physical or temporal barriers therefore prevent these users from completing the journeys for which the alternative is nominally available.

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7. Annexes

7.1 Literature review

Table 7-1. Sources reviewed for ETS2 analysis

Number	Author	Year	Title	Short name
1	European Commission	2021	Commission Staff Working Document – Impact Assessment Accompanying the Proposal to Amend the EU Emissions Trading System (Directive 2003/87/EC) and Related Acts (SWD(2021) 601 final)	EC 2021
2	CE Delft	2025	Impact of ETS2 on Vulnerable Groups: Analysis for the Social Climate Plan	CE Delft 2025
3	Taylor&Francis	2026	Carbon prices on the rise? Shedding light on the emerging second EU Emissions Trading System (EU ETS 2)	T&F 2026
4	Bruegel	2025	Making the best of the new EU Social Climate Fund	Bruegel 2025
5	ECCO	2025	ETS2 and energy costs: What are the benefits for consumers?	ECCO 2025
6	E&C Group	2025	Understanding the implications of the ETS2 system	E&C 2025
7	Transport & Environment	2025	How to turn the ETS2 implementation into a success	T&E 2025
8	European Parliamentary Research Service	2025	EU emissions trading system for buildings, road transport and additional sectors (ETS2): Status and concerns	EPRS 2025
9	BloombergNEF	2025	EU ETS II Pricing Scenarios	BNEF 2025
10	EWI – Institute of Energy Economics at the University of Cologne	2025	Impacts and Price Paths of the EU ETS2	EWI 2025
11	European Commission	2025	Commission Recommendation on transport poverty: ensuring affordable, accessible and fair mobility	EC 2025
12	Vella, A., et al. (ETC CM / EEA)	2026	ETC CM report 2025/09: EU ETS2 and Social Climate Fund: Enabling decarbonisation in transport and buildings that works for all	EEA / EIONET 2026
13	Cui, Y. & Wu, W. (Frontiers in Environmental Science)	2025	The economic burden of EU ETS2 carbon pricing on single and childless households: focusing on transport and building sectors	Frontiers 2025
14[39]	Schwab, T., et al. (Bertelsmann Stiftung)	2026	Heating Up Inequality? Socio-spatial impacts of ETS2 on European housing and cohesion	Bertelsmann 2026
15	Sigit Perdana & Marc Vielle (Elsevier)	2026	Regional inequality of the European ETS-2	Elsevier 2026

[39] This source focuses primarily on the residential heating sector rather than road transport. It is therefore used to inform ETS2 carbon price assumptions, but not to estimate transport-specific economic impacts or retail fuel-price effects.

Table 7-2. Reported ETS2 carbon price assumptions and analytical grouping used for scenario design

Source short name	Scenario / variant as reported	Analytical price grouping	Price value	Unit	Price basis	Reference year
EC 2021	MIX	Low	48	€/tCO_2	€2015	2030
EC 2021	MIX-CP	Medium	80	€/tCO_2	€2015	2030
CE Delft 2025	EC path	Low	30	€/tCO_2	€2023	2027
CE Delft 2025	EC path	Low	50	€/tCO_2	€2023	2028
CE Delft 2025	EC path	Low	55	€/tCO_2	€2023	2029
CE Delft 2025	EC path	Low	60	€/tCO_2	€2023	2030
CE Delft 2025	EC path	Low	60	€/tCO_2	€2023	2031
CE Delft 2025	EC path	Low	60	€/tCO_2	€2023	2032
T&F 2026	Strong EP	Medium	71	€/tCO_2	€2022	2030
T&F 2026	Limited EP	High	160	€/tCO_2	€2022	2030
T&F 2026	Weak EP	Very high	261	€/tCO_2	€2022	2030
Bruegel 2025	Soft-cap equivalent	Low	60	€/tCO_2	approx. 2027 nominal	2027
Bruegel 2025	High case	Very high	200	€/tCO_2	not specified	2030
ECCO 2025	Low scenario	Low	45	€/tCO_2	not specified	2027
ECCO 2025	High scenario	Medium	100	€/tCO_2	not specified	2027
T&E 2025	Soft-cap adjusted	Low	55	€/tCO_2	inflation-adjusted	2027
T&E 2025	High scenario	Medium	100	€/tCO_2	not specified	2027
EP 2025	Commission IA example	Low	48	€/tCO_2e	not specified	2030
EP 2025	Vertis lower forecast	High	111.7	€/tCO_2e	not specified	2030
EP 2025	Vertis upper forecast	Very high	259	€/tCO_2e	not specified	2030
BNEF 2025	Base case average	Medium	99	€/tCO_2	nominal	2029[40]
BNEF 2025	Base case peak	High	122	€/tCO_2	nominal	2030
EWI 2025	Equilibrium average	High	160	€/tCO_2e	not specified	2031
EWI 2025	Equilibrium 2027	High	120	€/tCO_2e	not specified	2027
EWI 2025	Equilibrium 2035	Very high	206	€/tCO_2e	not specified	2035
Frontiers 2025	Baseline ETS2 price	Low	60	€/tCO_2	2015 prices	2030
Frontiers 2025	High ETS2 price	Medium	80	€/tCO_2	2015 prices	2030
Bertelsmann 2026	Introductory heating scenario	Low	60	€/tCO_2	approx. 2027 nominal	2028
Bertelsmann 2026	Long-run heating scenario	High	180	€/tCO_2	not specified	2028
Elsevier 2026	Central ETS2 assumption	Medium	100	€/tCO_2	approx. 2027 nominal	2030

[40] The €99/tCO_2 value is reported as an average for 2027–2030 and is assigned to 2029 as a representative midpoint for calculation purposes.

Table 7-3. Reported assumptions and descriptions of ETS2-related scenarios in the reviewed sources

Source short name	Scenario / variant as reported	Assumptions / Description for the scenario
EC 2021	MIX	Policy mix scenario combining carbon price signal extension, strong intensification of energy and transport policies, and increased energy taxation. With a uniform carbon price, the scenario can represent two separate ETS systems with caps set to reflect cost-effective contributions from each ETS segment, creating a similar incentive as one extended ETS.
EC 2021	MIX-CP	More carbon-price-driven policy mix. Other policy drivers are applied at lower intensity than in MIX. The scenario illustrates revision of the EED and RED with limited intensification of existing policies, alongside a carbon price signal applied to new sectors. Unlike MIX, MIX-CP allows differentiated carbon price signals between the existing ETS and new ETS sectors, while maintaining a similar split of GHG reduction ambition between them.
CE Delft 2025	EC common ETS2 price path	CE Delft takes the ETS2 price path directly from the European Commission 2025 estimate. CE Delft does not reproduce the underlying EC modelling assumptions. The price path is described as an estimate, uncertain, and used as the basis for all calculations. CE Delft assumes full pass-through of ETS2 allowance costs by energy and fuel suppliers to end users, increasing gas, petrol and diesel prices. Member States can run sensitivity analyses, but the main Social Climate Plan scenario should be based on the common value.
Taylor & Francis 2026	Strong Efficiency Policies / Strong EP	The EU GHG emission reduction and energy-efficiency 2030 targets are met. Energy-efficiency policies are effective in all sectors. The scenario reflects the Fit-for-55 framework. The 2030 EU GHG reduction target of -55% is achieved, the EU ETS 1 target of -62% is achieved, the effort-sharing target of -30% and proposed EU ETS2 target of -43% are achieved, and the final energy reduction target of -9% is met or overshot. High ambition on energy-efficiency policies, including EPBD enforcement, minimum energy performance standards for new buildings, effective heat-pump support, deep renovation, district heating/cooling expansion, waste-heat recovery, and best available techniques compliance. EU 40% RES target is met or overshot. Renewable policies are tightly connected to deployment of renewables in buildings, transport and industry. Biofuel blending mandates and CO_2 standards are respected. Scenario changes are implemented EU-wide.
Taylor & Francis 2026	Limited Efficiency Policies / Limited EP	The 2030 EU GHG reduction target is met by design, but other targets can be missed or overachieved. The Limited EP scenario differs from Weak EP through the level of effectiveness of energy-efficiency policies. Meeting the EED target as in Strong EP is not mandatory. Medium ambition energy-efficiency assumptions apply: minimum energy performance standards exist but with limited penetration of heat pumps and deeper renovation. Compared with Strong EP, there is lower expansion of district heating and cooling, lower exploitation of waste-heat recovery, and lower compliance with best available techniques. Meeting the RES target as in Strong EP is not mandatory. Compared with Strong EP, the scenario assumes lower penetration of heat pumps, district heating and cooling, and consequently less renewables in buildings. No changes are made to aviation and maritime mandates from ReFuelEU and FuelEU, or to CO_2 standards compared with Strong EP. For electric vehicles, lower infrastructure development and lower use of electric vehicles for long-distance transport are assumed. Scenario changes are implemented EU-wide.
Taylor & Francis 2026	Weak Efficiency Policies / Weak EP	The 2030 EU GHG reduction target is met by design, but other targets can be missed or overachieved. Compared with Limited EP, the effectiveness of energy-efficiency policies is lower. Meeting the EED target as in Strong EP is not mandatory. Low ambition energy-efficiency assumptions apply: even lower supporting policies for deeper renovation and heat-pump penetration, lower district heating infrastructure expansion, and lower waste-heat recovery in industry. Meeting the RES target as in Strong EP is not mandatory. Compared with Limited EP, there is lower penetration of heat pumps, district heating and cooling, and consequently lower renewables in buildings. No changes are made to aviation and maritime mandates from ReFuelEU and FuelEU, or to CO_2 standards compared with Strong EP. For electric vehicles, lower infrastructure development and lower use of electric vehicles for long-distance transport are assumed. Scenario changes are implemented EU-wide.
Bruegel 2025	Soft-cap / moderate ETS2 price case	Bruegel uses the EU ETS2 soft-cap reference. The European Commission aims to protect a price ceiling of €45/tCO_2 in 2020 prices, equivalent to approximately €60/tCO_2 when ETS2 starts in 2027. The scenario assumes EU price-stability safeguards broadly contain ETS2 prices around the intended soft-cap level, although actual prices may deviate.

Source short name	Scenario / variant as reported	Assumptions / Description for the scenario
ECCO 2025	Low / Commission-reference scenario	Low-price scenario reported by ECCO as a Commission reference. The scenario assumes that increased allowance supply in the early years of ETS2 implementation reduces price pressure. Carbon pricing operates alongside complementary decarbonisation policies rather than in isolation. ECCO does not specify the price-year basis.
ECCO 2025	Soft-cap / lower-bound corridor scenario	Scenario corresponding to the ETS2 soft price-cap reference and the lower level of ECCO's proposed price corridor. It assumes that ETS2 price-control tools and complementary policies contain prices around the soft-cap level. Complementary policies include dynamic quota bidding, revenue recycling towards electric technologies, energy-taxation rebalancing, vehicle emission standards and building performance targets. ECCO does not specify the price-year basis.
ECCO 2025	Upper-corridor / consumer-protection scenario	Illustrative upper bound for a national ETS2 price corridor. If ETS2 prices exceed this threshold, Member States activate direct refund mechanisms to protect end consumers from excessive fossil-fuel price increases. The €100/tCO_2 value is therefore a consumer-protection policy threshold rather than a pure market-price forecast. ECCO does not specify the price-year basis.
T&E 2025	Soft-cap scenario	T&E derives the value from the ETS2 soft-cap of €45/tCO_2 in 2020 euros, adjusted for inflation. The scenario assumes Fit for 55 and complementary policies are effectively implemented, price-containment mechanisms keep ETS2 prices close to the soft-cap level, and revenue recycling plus early investments reduce fossil-fuel demand.
T&E 2025	Higher-price sensitivity scenario	Higher-price sensitivity. The scenario assumes complementary policies underdeliver, fossil-fuel emissions in road transport and buildings remain higher than required, and allowance demand from fuel suppliers, hedging and speculative investment pushes ETS2 prices above the soft-cap level. It also reflects the risk that large emitting Member States do not reduce emissions fast enough, creating EU-wide price pressure. Price-year basis is not explicitly specified.
European Parliament 2025	Commission IA example	Commission impact-assessment illustrative carbon-price case used to estimate fuel-price impacts. Assumes ETS2 compliance costs are passed through by fuel suppliers to consumers. At €48/tCO_2e, estimated impacts are +€0.11/l petrol and +€0.13/l diesel.
European Parliament 2025	Vertis lower forecast	External Vertis forecast cited by the European Parliament. Reflects a high-price outcome where the ETS2 soft cap is not a hard ceiling and MSR safeguards do not fully contain price increases. Assumes sustained allowance demand and limited price-containment capacity.
European Parliament 2025	Vertis upper forecast	Upper end of the external Vertis forecast cited by the European Parliament. Represents a very high-price outcome by 2030. The provided evidence is truncated after "driven by stronger", so no further assumption should be added from the available data.
Bloomberg 2025	Base case / current design	Nominal price basis. Assumes current ETS2 design, inflexible supply adjustment, insufficient complementary policies, costly electrification options, and sustained allowance demand.
Bloomberg 2025	Supply-adjustment scenario	Nominal price basis. Assumes more flexible allowance supply through MSR/frontloading reforms, lower allowance scarcity, and weaker emissions reductions.
Bloomberg 2025	Revenue-recycling / subsidy scenario	Nominal price basis. Assumes substantial ETS2 revenue recycling into EV, heat-pump and electricity-cost subsidies, lower marginal abatement costs, and faster consumer switching.
Bloomberg 2025	Complementary policies / reduced-demand scenario	Nominal price basis. Assumes vehicle and building sectoral standards are fully implemented, baseline emissions fall, and allowance demand declines.
Bloomberg 2025	Combined policy package / low-price scenario	Nominal price basis. Assumes dynamic MSR TNAC adjustment, expanded cost-containment rules, smoother frontloading, and recycling of 24%–36% of ETS2 revenues into subsidies.
EWI 2025	Equilibrium 2027	Price basis not explicitly specified. Endogenous ETS2 equilibrium path. Assumes investment-based abatement only, no behavioural demand reduction, exogenous heat and transport demand, overlapping policies included, and MSR/frontloading included but insufficient.
EWI 2025	Equilibrium average to 2035	Price basis not explicitly specified. Same EWI equilibrium scenario. Average price reflects high marginal abatement costs and allowance scarcity over the modelled period.
EWI 2025	Equilibrium 2035	Price basis not explicitly specified. Same EWI equilibrium scenario. After a temporary plateau around 2032, prices rise again as allowance scarcity and investment-based abatement needs persist.

Source short name	Scenario / variant as reported	Assumptions / Description for the scenario
Frontiers 2025	Standard non-transport/building carbon price	Applies to all products excluding transport and building fuels. Derived from the EU ETS2 soft-cap threshold of €45/tCO_2 in 2020 prices, converted to €42/tCO_2 in 2015 prices.
Frontiers 2025	Baseline ETS2 transport/building fuel scenario	Applies to transport and building fuels. Based on the Commission's €48–€80/tCO_2 range in 2015 prices for creating market incentives for building retrofits and low-emission transport by 2030. Aligned with Günther et al. (2024)'s "Strong Efficiency Policies" scenario of €71/tCO_2 in 2022 prices, equivalent to €60/tCO_2 in 2015 prices.
Frontiers 2025	Upper-bound sensitivity / stronger carbon-pricing scenario	Applies to transport and building fuels. Upper bound of the Commission's €48–€80/tCO_2 range in 2015 prices. Reflects policy scenarios relying more heavily on carbon pricing, especially MIX-CP, and is used to test stronger carbon-price burdens across household types.
Bertelsmann Stiftung 2026	Expected initial ETS2 heating price	Residential heating only. Price basis not formally specified. Moderate initial-price scenario. Assumes current expectations for ETS2 introduction, soft-cap/price-stabilisation context, existing national carbon prices, taxes, VAT and fuel-specific emission factors accounted for, and household behavioural responses included.
Bertelsmann Stiftung 2026	Hypothetical long-run high ETS2 heating price	Residential heating only. High long-run stress scenario. Assumes a possible long-run price if the ETS2 cap tightens and emissions reductions lag. Used as an upper-bound impact test. Assumes fossil-heating systems largely remain in place when estimating household burdens.
Elsevier / Energy Policy 2026	Central ETS2 impact scenario	Heating and transport fuels. Price basis not explicitly specified. Literature-based central ETS2 price assumption. Authors select €100/tCO_2 as an average or representative value within a projected range of €71–€261/tCO_2. The range depends on the stringency of complementary energy-efficiency policies: strong policies lower the ETS2 price, while weaker policy stringency leads to higher prices. Used to simulate household expenditure impacts across heating and transport fuels.

Table 7-4. Evidence coverage for Step Differences across Members states impact assessment

Evidence type	Sources	Treatment in this section
Explicit Member State or regional evidence	EC 2021, Bruegel 2025, T&E 2025, EPRS 2025, BNEF 2025, EWI 2025, EC 2025, EEA / EIONET 2026, Frontiers 2025, Bertelsmann 2026, Elsevier 2026	Used to identify the main drivers of cross-country and territorial differences.
Limited or country-specific evidence	CE Delft 2025, ECCO 2025	Used with caution. CE Delft focuses on the Netherlands; ECCO focuses mainly on Italy but discusses EU-wide price dynamics linked to large emitters.
No Member State-level modelling	T&F 2026, E&C 2025	Used for ETS2 price or regulatory context only, not for Member State differentiation.

Table 7-5. Evidence coverage for Step 3 distributional and consumer-level impact assessment

Evidence dimension	Main sources used	Treatment in this step
Income-group impacts	EC 2021, CE Delft 2025, ECCO 2025, T&E 2025, EPRS 2025, BNEF 2025, EWI 2025, EC 2025, EEA / EIONET 2026, Elsevier 2026	Used to assess how road fuel-price increases affect lower-income groups, lower-middle-income car users, and households at risk of transport poverty.
Territorial differences	CE Delft 2025, Bruegel 2025, EC 2025, EEA / EIONET 2026, T&E 2025, Elsevier 2026	Used to assess differences between urban, suburban, peri-urban, rural and remote areas.
Mobility profiles	EC 2021, CE Delft 2025, Bruegel 2025, ECCO 2025, T&E 2025, EPRS 2025, BNEF 2025, EWI 2025, EC 2025, EEA / EIONET 2026, Elsevier 2026	Used to identify exposed user groups, including car-dependent households, users with limited public transport access, EV owners and households relying on older internal combustion vehicles.

7.2 Exposure index tables

Table 7-6: Underlying exposure index

Legend: 1: Relatively lower exposure; 2: Moderate relative exposure; 3: Relatively higher exposure

Legend: 3-4: Relatively lower exposure; 5-7: Moderate relative exposure; 8-9: Relatively higher exposure

Member State	Structural exposure Transport fuel consumption	Economic resilience Median household income	Observed fuel burden Household expenditure on transport fuels as a share of total household expenditure	Underlying exposure index
Belgium	3	1	1	**5**
Bulgaria	1	3	2	**6**
Czechia	3	2	2	**7**
Denmark	2	1	1	**4**
Germany	1	1	1	**3**
Estonia	1	3	2	**6**
Ireland	3	1	2	**6**
Greece	2	3	3	**8**
Spain	2	2	1	**5**
France	2	2	2	**6**
Croatia	3	2	3	**8**
Italy	2	2	3	**7**
Cyprus	3	2	3	**8**
Latvia	1	3	3	**7**
Lithuania	2	3	1	**6**
Luxembourg	2	1	1	**3**
Hungary	2	3	2	**7**
Malta	1	2	3	**6**
Netherlands	1	1	1	**3**
Austria	3	1	1	**5**
Poland	3	2	3	**8**
Portugal	2	3	3	**8**
Romania	2[41]	3	1	**5**
Slovenia	3	2	3	**8**
Slovakia	2	3	2	**7**
Finland	1	1	2	**4**
Sweden	1	1	3	**5**

[41]

Table 7-7: Existing carbon pricing instruments in EU Member States

MS	Description
Austria	• Austria launched its national emissions certificate trading system (Nationales Emissionszertifikatehandelsgesetz – NEHG) for fossil fuels not already covered by the EU ETS in October 2022. • Although the NEHG does not establish a carbon tax, the carbon pricing instrument follows in central parts the logic of existing energy taxes (fuel tax, coal tax, and natural gas tax). Thus, if a certain event is taxable under the existing energy taxes regime, an obligation to buy allowances arises under the NEHG. Taxable events are the production, import, or release of energy products from a tax warehouse in Austria or the supply of coal and natural gas to consumers. • The NEHG aims to cover emissions outside the EU ETS, encompassing predominantly emissions in the buildings and transport sectors. Between 2022 and 2025, the system operated with an annually increasing fixed price and a flexible cap, such that more allowances will be available for entities if needed. The NEHG is being phased in gradually. The system has been designed in line with the reduction targets for non-EU ETS sectors as defined by the "European Effort Sharing Regulation" (ESR). The system will be transferred into the EU ETS 2.
Denmark	• The Danish carbon tax was introduced to provide an economic incentive to consume less energy from carbon-intensive sources. It was introduced gradually as part of a package, which includes subsidies for green investments. The tax complements the EU ETS, covering both the fuel-use captured and not captured under the ETS. The tax rate for each fuel is calculated based on volume, weight or calorific value of fuel used, with rates for each fuel set to align with the nominated /tCO2-e price. The tax is indexed annually to take inflation into account.
Finland	• Finland introduced its carbon tax (official name: Hiilidioksidivero) in 1990, making it the first country to introduce a carbon tax. The carbon tax is a component of the energy tax (official name: Energiavero), which also includes components-based energy content and a contribution to maintaining the security of supply. The base of the carbon tax is the lifetime CO2 emissions of a product. The tax strengthens incentives created under the EU ETS, adding additional carbon costs to fuel-use emissions and capturing additional emissions not captured under the ETS.
France	• There are two main mechanisms for effective carbon pricing in France: the excise tax on fossil fuels and the European Union Emissions Trading System (EU ETS). In addition to these, there are three other mechanisms: the European market for fluorinated gas quotas, as well as the waste and emissions components of the general tax on polluting activities (TGAP). These mechanisms sometimes overlap for the same product. • The French carbon tax (Contribution Climat-Énergie or CCE) is attached to the domestic excise taxes on energy consumption (fraction perçue en métropole sur les produits énergétiques, l'électricité et le gaz), increasing their overall rate. These excise taxes are added to the final price of petrol, diesel, heating oil or natural gas, so are paid by individuals and businesses.
Germany	• Germany launched its national ETS (Nationales Emissionshandelssystem) for heating and transport fuels in 2021. With the introduction of the ETS, a wide range of sectors in Germany are now subject to a carbon price. • The national ETS complements the EU ETS by covering all fuel emissions not covered by the bloc's system. It is being phased in gradually, with an increasing fixed price per tCO2 from 2021 to 2025. In 2026, allowances are auctioned within a price corridor of EUR 55 to EUR 65/tCO2, with an additional fixed-price option of EUR 68/tCO2 available after the auctioning period if the cap is exceeded. • During the fixed price and price corridor phases, the cap is flexible. Covered entities must surrender allowances for all their covered emissions, and allocation is based on auctions or free allocation. • The national ETS was established through the 2019 "Fuel Emissions Trading Act" 2019, which was amended in 2020, 2022 and again in 2023.
Hungary	• The Carbon Tax applies to EU ETS participants receiving at least 50% of allowances for free and where their annual greenhouse gas emission are above 25,000 tons of CO2e. It applies retrospectively from January 2023.
Ireland	• Ireland's carbon taxes (officially under three names: Natural Gas Carbon Tax (NGCT), Mineral Oil Tax: Carbon Charge (MOTCC) and Solid Fuel Carbon Tax (SFCT)) aim to reduce GHG emissions while using part of the revenue raised to boost energy efficiency, to alleviate fuel poverty and to encourage more sustainable farming practices. The Finance Act 2020 legislated for ten annual increases in carbon tax rates so that by 2030 all rates would be based on charging EUR100/tCO2. A series of annual increases of EUR7.50 apply to the amount charged per tCO2 emitted coming into effect from 2021 and for each year thereafter up to and including 2029 with a final increase of EUR6.50 in 2030. The tax complements the EU ETS, covering emissions from fuel combustion not covered by the ETS.

MS	Description
Luxembourg	• Luxembourg implemented its carbon tax (taxe CO2) on fossil fuels as a way to create a minimum carbon price similar to those in neighboring countries. Luxembourg's carbon tax policy complements the EU ETS, which does not cover emissions from transportation, buildings and shipping. Imposition of the tax was accompanied by increased social support for low-income earners. Some of the revenues accrue to a climate and energy fund.
Poland	• The Poland carbon tax (Stawki opłat za korzystanie ze środowiska, as applied to GHGs) is part of the Environmental Protection Act (Prawo ochrony srodowiska), which taxes different kinds of environmental emissions such as CO2 and other GHG emissions, dust, sewage and waste. The price increases each year in line with inflation. The tax complements the EU ETS, capturing emissions from fuel use not covered by the ETS.
Slovenia	• Tax is payable for an atmospheric pollution by CO2 emissions from fuels (burning of liquid, gaseous and solid fuels). • Fuels, which are subject to the environmental tax are listed in the Annex 1 to Decree on environmental tax on carbon dioxide emissions (OJ RS, number 48/2018). Tax base is 30.85 euros per unit of pollution. Units of pollution of each fuel type are presented in annex 1 to above mentioned Decree (example: petrol 2,3 units of pollution = 39,79 euros/ 1000 l, liquefied petroleum gas 2,9 units of pollution = 50,17 euros/ 1000 kg). • Tax payers are producers, acquirers from other EU countries and importers of fuels from third countries.
Sweden	• The Sweden carbon tax (Koldioxidskatt) is part of the tax on energy (skatt pa energi). The tax placed on carbon-intensive fuels aims to actively reduce dependency of fossil fuels. Carbon dioxide tax was first taxed in 1991, but significant changes were made in 1994. The law from 1994 still remains in force (with adjustments).

Source: Ricardo elaboration on World Bank data: State and Trends of Carbon Pricing Dashboard

Table 7-8: Adjusted exposure index

	Legend: 1: Relatively lower exposure 2: Moderate relative exposure 3: Relatively higher exposure			**Legend: 3-4: Relatively lower exposure 5-7: Moderate relative exposure 8-9: Relatively higher exposure**
Belgium	2	1	3	**6**
Bulgaria	2	3	3	**8**
Czechia	2	3	3	**8**
Denmark	1	1	1	**3**
Germany	1	1	1	**3**
Estonia	2	2	3	**7**
Ireland	2	1	1	**4**
Greece	3	3	3	**9**
Spain	2	2	3	**7**
France	2	2	1	**5**
Croatia	3	3	3	**9**
Italy	2	3	3	**8**
Cyprus	3	3	3	**9**
Latvia	2	2	3	**7**
Lithuania	2	2	3	**7**
Luxembourg	1	1	1	**3**

	Legend: 1: Relatively lower exposure 2: Moderate relative exposure 3: Relatively higher exposure			Legend: 3-4: Relatively lower exposure 5-7: Moderate relative exposure 8-9: Relatively higher exposure
Hungary	2	2	1	**5**
Malta	2	2	3	**7**
Netherlands	1	1	3	**5**
Austria	2	1	1	**4**
Poland	3	3	1	**7**
Portugal	3	2	3	**8**
Romania	2	3	3	**8**
Slovenia	3	2	1	**6**
Slovakia	2	3	3	**8**
Finland	1	1	1	**3**
Sweden	2	1	1	**4**

7.3 Legal review

Table 7-9: Overview of typical soft vs hard law formulations used by the European Commission

Wording	Typical formulation	Legal signal	Legal character
shall	"Member States **shall** ensure that…"	Mandatory	Binding obligation (hard law)
must	"Authorities **must** comply with…"	Mandatory	Binding obligation (hard law)
is required to	"The Commission **is required to**…"	Mandatory	Binding obligation (hard law)
may	"Member States **may** adopt measures …"	Permissive	Discretionary power (not obligatory)
may only	"Member States **may only**…"	Limiting discretion	Binding constraint (hard law)
shall be entitled to / have the right to	"Applicants **shall have the right** to…"	Rights-conferring	Binding (individual right)
should	"Member States **should** encourage …"	Exhortatory	Soft law / non-binding
are encouraged to	"Authorities **are encouraged to**…"	Policy guidance	Soft law
endeavour to	"Member States **shall endeavour to**…"	Best-efforts	Weak / programmatic obligation
aim to / seek to	"This Directive **aims to**…"	Objective-setting	Soft / programmatic

Wording	Typical formulation	Legal signal	Legal character
promote / support	"Member States shall **promote**…"	Policy orientation	Soft or procedural obligation
where appropriate / where relevant	"…**where appropriate**…"	Conditional	Softens obligation
take appropriate measures	"Member States shall **take appropriate measures**…"	Procedural duty	Binding as to effort, not result
best practices / guidelines	"In accordance with guidelines…"	Interpretative	Soft law (ancillary)
recital language (any verb)	"It is necessary to ensure…"	Contextual	Never binding per se

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