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The EU Emissions Trading System EU-ETS 2

Under Pressure, But Indispensable for Decarbonising Heavy-Duty Transport

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EU climate policy is at a critical juncture. High energy prices and insufficient political efforts to ensure a fair distribution of the economic burden of the green transition have given rise to concerns regarding the social acceptability of climate protection measures, resulting in calls for the postponement, modification or even abolishment of the emissions trading system for the road transport and buildings sectors (EU-ETS°2). Many Member States are concerned that its planned introduction in 2027 could quickly lead to high CO_2 prices, which would make fossil fuels unpopularly expensive. The cep recommends:

- The EU-ETS 2 is indispensable for the effective and cost-efficient reduction of GHG emissions in the road transport and buildings sectors, including heavy-duty transport, and therefore should not be abolished.
- Modifications currently called for would undermine the core functions of the EU-ETS 2 of effectively and cost-efficiently reducing GHG emissions. Weakening emissions trading would risk the achievement of the climate target in road transport and buildings sectors and could also prompt politicians to introduce even stricter command-and-control measures, which would disproportionately affect low-income groups.
- The solution should not be the weakening or even abolishment of the EU-ETS 2, but rather the consistent implementation of market-neutral compensation mechanisms. In this respect, the Social Climate Fund provides Member States with necessary, although not sufficient means to ensure that the transition is socially acceptable. Political efforts should therefore focus on strengthening the role of such support mechanisms in alleviating undesirable social hardship of carbon pricing.

This study was commissioned by the Association des Constructeurs Européens d’Automobiles (ACEA).

Executive Summary

High energy prices have given rise to concerns regarding the social acceptability of EU climate protection measures, resulting also in calls for the postponement, modification or even abolishment of the emissions trading system for the road transport and buildings sectors (EU-ETS°2). It is feared that its planned introduction in 2027 could quickly lead to high CO_2 prices, which would make fossil fuels unpopularly expensive. While the EU-ETS 2 is increasingly under pressure even before its start, it is indispensable for the decarbonisation of the road transport and buildings sectors, including heavy-duty transport.

- By setting an overall cap on the maximum amount of allowed emissions of greenhouse gases (GHGs) and at the same guaranteeing flexibility in the choice of options to avoid emissions, the EU-ETS 2 is the most effective instrument for achieving the climate target in these sectors.

- The uniform, market-driven CO_2 price generated by the trade in EU-ETS 2 allowances enables the identification and realisation of the most cost-efficient GHG mitigation options.

- The CO_2 price signal of the EU-ETS 2 reduces the Total Cost of Ownership (TCO) of zero- and low-emission vehicles, including HDVs, relative to fossil-fuelled vehicles, thereby steering the market towards climate-friendly technologies. Therefore, a potential failure of the EU-ETS 2 to deliver a sufficiently high CO_2 price could lead to a persistent TCO disadvantage of climate-friendly HDVs.

- Given that essential elements of the EU's legislative framework for the decarbonisation of the road transport sector – such as amendments of the Energy Taxation Directive or the Weights and Dimensions of Commercial Vehicles Directive – are still missing, the EU-ETS 2 with its cap and a sufficiently strong CO_2 price signal is even more pivotal for the attainment of climate targets.

- Modifications recently called for by 18 Member States would undermine the core functions of the EU-ETS 2 of effectively and cost-efficiently reducing GHG emissions. Weakening emissions trading would risk the achievement of the climate target in the road transport and buildings sectors and could also prompt politicians to introduce even stricter command-and-control measures, which would disproportionately affect low-income groups.

- The solution should not be the weakening or even abolishment of the EU-ETS 2, but rather the consistent implementation of market-neutral compensation mechanisms. In this respect, the Social Climate Fund provides Member States with necessary although not sufficient means to ensure that the transition is socially acceptable. Political efforts should therefore focus on strengthening the role of such support mechanisms in alleviating undesirable social hardship of carbon pricing.

Content

1 Introduction

The European Union has committed itself to reduce its Greenhouse Gas (GHG) emissions until 2030 by 55% compared to 1990 and to become climate-neutral by 2050. To achieve these climate targets, the EU has enacted a multitude of instruments covering all sectors as part of the “Fit for 55” reforms of its climate and energy legislation. For the decarbonisation of the road transport and buildings sectors, including heavy-duty transport, a key instrument is the new EU Emissions Trading System EU-ETS 2. By putting a carbon price on fossil fuels, it aims to incentivise the roll-out of climate-friendly technologies.

With its application in 2027 rapidly approaching, however, the EU-ETS 2 is increasingly met with scepticism. High energy prices have given rise to concerns regarding the social acceptability of the EU-ETS 2. It is feared that its introduction will quickly lead to high CO_2 prices, which would make fossil fuels unpopularly expensive. Consequently, political pressure is mounting for the postponement, modification or even abolishment of the EU-ETS°2. In July 2025, a group of 18 Member States, representing a qualified majority in the Council of the EU, sent a “joint non-paper” to the European Commission demanding modifications of the EU-ETS 2 regulatory framework.

This study examines the design and intended functioning of the EU-ETS 2 and its accompanying Social Climate Fund (SCF) within the overall EU regulatory framework as well as its potential to contribute to the EU climate targets in an ecologically/climatically effective, economically efficient and socially equitable way in comparison to other policy instruments. Moreover, the study presents current implementation efforts of Member States, looks at initiatives especially by a growing number of Member States for a revision, and identifies requirements and opportunities for starting a legislative process in this respect.

Finally, the study assesses from an economic point of view various potential modifications to the EU-ETS 2 that are currently under discussion – such as expansions of frontloading and of the scope of the market stability reserve, the introduction of price caps, and changes to revenue redistribution. It evaluates their impacts on efficiency, investment incentives, predictability, and fairness.

2 State of Play

2.1 Status quo of the EU Regulatory Framework

2.1.1 Overview

The main regulatory instruments of EU climate policy with relevance for the decarbonisation of road transport in general and heavy-duty vehicles (HDVs: trucks and buses) in particular[1] are the EU Emissions Trading Directive [EU-ETS, 2003/87/EC][2] and the Effort Sharing Regulation [ESR, (EU) 2018/842][3]. By means of the **ETS Directive**, the EU aims to reduce its GHG emissions caused by energy generation, energy-intensive industries, aviation and maritime transport by 62% by 2030 compared to 2005 through its established emissions trading system (**EU-ETS 1**), which covers energy production, energy-intensive industries, air, and maritime transport. As of 2027, the new emissions trading system for fuel combustion in road transport, buildings, and additional sectors using fossil fuels (**EU-ETS 2**) is designed to price GHG emissions to contribute to 42% emission reductions by 2030 compared to 2005. The **Effort Sharing Regulation** sets an EU-wide emission reduction target of 40% by 2030 compared to 2005 for domestic transport, buildings, agriculture, waste, and small industries, and also legally binding GHG reduction targets for each EU Member State, ranging from 10% for Bulgaria to 50% for Germany.

These targets and provisions of EU climate policy are **complemented by various specific regulatory instruments** which pursue different approaches and regulate, for example, the promotion of renewable energy[4] and energy efficiency in various sectors[5]. In particular, **sector-specific provisions** such as **CO_2 emission standards for new HDVs** have been set.

2.1.2 Emissions Trading for Energy, Industry, Aviation, Maritime (EU-ETS 1)

Since 2005, the central cornerstone of the EU climate policy for the avoidance and reduction of GHG emissions has been the **EU Emissions Trading System (EU-ETS 1)**.[6] The EU-ETS 1 follows a “cap-and-trade” approach. It sets a cap on the maximum allowable GHG emissions from the sectors covered – energy production, energy-intensive industries, flights within the EU, maritime transport – by limiting the amount of EU-ETS 1 emission allowances and lowering them annually by a linear reduction factor – 2024-2027: 4.3%, 2028 onwards: 4.4% – so that total GHG emissions are reduced gradually. EU-ETS 1 emission allowances are tradeable. In the context of the “Fit for 55” reforms, the EU increased the EU-

1 For the following, see also Menner, M. / Reichert, G. / Voßwinkel, J. / Wolf, Á. (2025), Towards Decarbonised Road Transport Driven by a Globally Competitive EU Automotive Industry, cepStudy [this and all following links last accessed on 8 September 2025], pp. 16 et seq.

2 Directive (EU) 2023/959 amending Directive 2003/87/EC establishing a system for GHG emission allowance trading within the Union [ETS Directive 2003/87/EC] and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union GHG emission trading system [MSR Decision (EU) 2015/1814]; Regulation (EU) 2023/957 amending Regulation (EU) 2015/757.

3 Regulation (EU) 2023/857 amending Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement, and Regulation (EU) 2018/1999.

4 Directive (EU) 2023/2413 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652.

5 Directive (EU) 2023/1791 on energy efficiency and amending Regulation (EU) 2023/955 (recast).

6 Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union. European Commission (2021), Proposal COM(2021) 551 for a Directive amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757; see Menner, M. / Reichert, G. (2022), Fit for 55: EU-Emission Trading Scheme (EU ETS I) for Industry and Energy, cepPolicyBrief 05/2022.

wide target for reducing GHG emissions in sectors covered by the EU-ETS 1 in the period 2021-2030 by 62% compared to 2005 levels.

2.1.3 Emissions Trading for Road Transport and Buildings (EU-ETS 2)

As part of the "Fit for 55" reform of the ETS Directive, the EU established as from 2027 a **new separate emissions trading system (EU-ETS 2)**[7] to incentivise the reduction of GHG emissions from **fossil fuels combusted in the road transport and buildings sectors**.[8] Like the EU-ETS 1, the EU-ETS 2 is a cap-and-trade system.

It sets a **cap** on the maximum allowed GHG emissions from the sectors covered by limiting the amount of EU-ETS 2 emission allowances[9] and lowering them annually. The total number of allowances issued in the EU-ETS 2 will be reduced annually by a linear reduction factor of 5.10% in 2027[10] and by 5.38% from 2028 onwards[11], and will reach zero by 2044 (see Figure 1). Unlike the EU-ETS 1, however, the EU-ETS 2 requires not the end consumers of fuels to hold emission allowances, but any natural or legal person liable to pay excise duties on energy, such as tax warehouses and fuel suppliers (**"upstream"**).[12] The carbon price they have to pay for the allowances is usually passed on through the supply chain to the end consumers. The regulated entities covered by the EU-ETS 2 must surrender allowances for their verified GHG emissions corresponding to the quantities of fuels they have released for consumption.[13] Although the surrendering of allowances under the EU-ETS 2 will only commence in 2028 for 2027 emissions, monitoring and reporting of emissions already begun on 1 January 2025.[14] EU-ETS 2 allowances will not be fungible with allowances traded in the existing EU-ETS 1 and will be placed on the market only by auctioning, without free allocation.[15]

EU-ETS 2 emission allowances are **tradeable**. While the price of allowances is generally determined by supply and demand, the ETS Directive contains several **safeguards to avoid "excessively" high and volatile carbon prices** for EU-ETS 2 allowances under certain circumstances:

1. To avoid a disruptive increase in fuel prices at the start of the system, the auctioning of EU-ETS 2 allowances will start in 2027 with an amount corresponding to **130%** of the auction volumes calculated for 2027 (**"frontloading"**). These 30% additional allowance will be deducted from the auction volumes calculated for the period 2029-2031 and may be auctioned until 31 May 2028 (see Figure 1 for a possible scenario).[16]

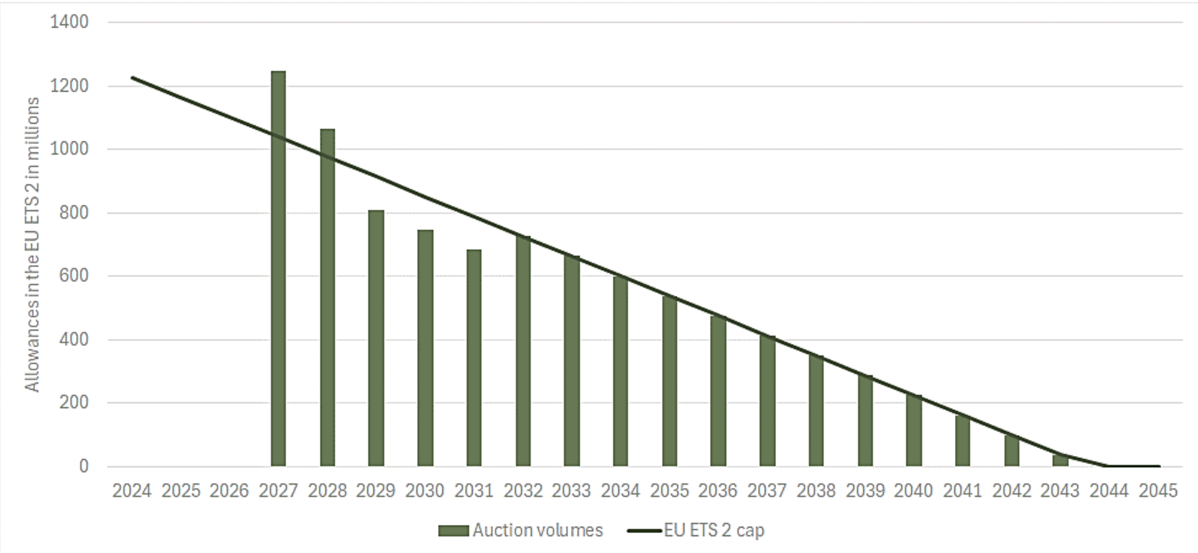
2. To soften price volatility, the EU-ETS 2, like the EU-ETS 1, also features a separate **Market Stability Reserve (MSR)** which will become operational as of 1 September 2028.[17] If the total number of EU-ETS 2 allowances in circulation in a certain year is above 440 million allowances, 100 million EU-ETS 2 allowances have to be deducted from the quantity of allowances to be auctioned by the

7 ETS Directive 2003/87/EC, Chapter IVa, Art. 30a-30m; see Menner, M. / Reichert, G. (2022), Fit for 55: Climate and Road Transport, cepPolicyBrief 06/2022.
8 ETS Directive 2003/87/EC, Art. 30a in conjunction with Annex III.
9 Commission Decision (EU) 2024/2951 on the Union-wide quantity of allowances to be issued under the EU ETS for buildings, road transport and additional sectors for 2027.
10 ETS Directive 2003/87/EC, Art. 30c (1).
11 Id., Art. 30c (2).
12 Id., Art. 30b in conjunction with Annex III.
13 Id., Art. 30e.
14 Id., Art. 30f (2).
15 Id., Art. 30d.
16 Id., Art. 30d (2) in conjunction with MSR Decision (EU) 2015/1814, Art. 1a (3).
17 ETS Directive 2003/87/EC, Art. 30d in conjunction with MSR Decision (EU) 2015/1814, Art. 1a.

Member States and have to be placed in MSR over a period of 12 months beginning on 1 September of that year.[18] If the total number of EU-ETS 2 allowances in circulation in a year is lower than 210 million, 100 million EU-ETS 2 allowances have to be released from the MSR and added to the quantity of EU-ETS 2 allowances to be auctioned by the Member States. Where fewer than 100 million allowances are in the MSR, all allowances in the reserve must be released.[19] Where, for more than three consecutive months, the average auction price of EU-ETS 2 allowances is more than twice the average price during the six preceding consecutive months, 50 million allowances must be released from the MSR. For the years 2027 and 2028, this condition is met where, for more than three consecutive months, the average price of EU-ETS 2 allowances is more than 1,5 times the average price during the reference period of the six preceding consecutive months.[20]

3. A **"soft price cap" of 45 €** (in prices of 2020!)[21] applies until 2029, corresponding to a carbon price of approximately 0.13 € per litre of gasoline or 0.14 € per litre of diesel. If this is reached, additional allowances will be released from the MSR but only to a limited extent and, except in exceptional cases, no more than twice a year. The European Commission will review the scheme and report by the end of 2029 on whether the mechanism should be maintained. If necessary, it will propose an amendment to the ETS Directive.[22]

Figure 1: Approximate auction volumes and cap of EU-ETS 2 allowances



Source: carboneer[23]

The **start of auctioning of EU-ETS 2 allowances** must be **postponed to 2028** if one or both of the following conditions are met:[24] (1) the average **TTF gas price** for the six calendar months ending 30 June 2026 was higher than the average TTF gas price in February and March 2022; (2) the average **Brent crude oil price** for the six calendar months ending 30 June 2026 was more than twice the average Brent

18 MSR Decision (EU) 2015/1814, Art. 1a (5).
19 Id., Art. 1a (5).
20 ETS Directive 2003/87/EC, Art. 30h (1) in conjunction with MSR Decision (EU) 2015/1814, Art. 1a (7).
21 Based on 2021-2024 changes in the EU Harmonised Index of Consumer Prices (HICP) and assuming an annual inflation rate of 2% for the years 2025-2027, we estimate an inflation-adjusted price cap in 2027 of about 57 €.
22 ETS Directive 2003/87/EC, Art. 30h (2) and (5).
23 Carboneer (2024), The EU-ETS-2 – pricing emissions in buildings and road transport.
24 Regulation (EU) 2023/955 establishing a Social Climate Fund and amending Regulation (EU) 2021/1060 [SCF Regulation (EU) 2023/955], Art. 30k.

crude oil price during the five preceding years. Consequently, uncertainty about a potential postponement of the EU-ETS 2 to 2028 will remain until mid-2026, when the necessary data will only be available.

2.1.4 Social Climate Fund (SCF)

Given the economic burden posed on consumers by carbon pricing in the road transport and buildings sectors, the EU-ETS 2 is accompanied by the **Social Climate Fund (SCF)**[25] set up for the period 2026-2032[26]. The general objective of the SCF is "to contribute to a socially fair transition towards climate neutrality by **addressing the social impacts" of the EU-ETS 2**.[27] To this end, the SCF aims to support vulnerable households[28], vulnerable micro-enterprises[29] and vulnerable transport users[30], through temporary direct income support and measures and also investments intended to increase the energy efficiency of buildings, decarbonisation of heating and cooling of buildings, including through the integration in buildings of renewable energy generation and storage, and to grant improved access to zero- and low-emission mobility and transport.[31]

The SCF serves to provide financial support to Member States for measures and investments included in their Social Climate Plans[32]. A maximum of **65 billion € from 2026 to 2032** in current prices is allocated to the SCF.[33] Given that the SCF is financed mainly by the revenues generated by the auctioning of EU-ETS 2 allowances, it is inherently dependent on the actual operation of the EU-ETS 2. In addition, Member States must contribute at least 25% of the estimated total costs of their Plans.[34] Should the EU-ETS 2 be postponed until 2028[35], the maximum amount to be allocated to the Fund would be 54.6 billion Euro.[36] The maximum financial allocation to each Member State under the SCF (share in %) ranges from 0.07% (Malta) over 8.18% (Germany) to 17.6% (Poland).[37]

Each Member State must submit to the Commission its **Social Climate Plan** specifying a set of existing or new national measures and investments to address the impact of carbon pricing on vulnerable households, vulnerable micro-enterprises and vulnerable transport users in order to ensure affordable heating, cooling and mobility, while accompanying and accelerating the necessary measures to meet the EU climate targets.[38] The Plan may also include national measures providing temporary direct

[25] SCF Regulation (EU) 2023/955.
[26] Id., Art. 1.
[27] Id., Art. 3 (1).
[28] According to Art. 2 (10) SCF Regulation (EU) 2023/955, "vulnerable households" are "households in energy poverty or households, including low income and lower middle-income ones, that are significantly affected by the price impacts" of the EU-ETS 2 "and lack the means to renovate the building they occupy".
[29] According to Art. 2 (11) SCF Regulation (EU) 2023/955, "vulnerable micro-enterprises" are "micro-enterprises that are significantly affected by the price impacts" of the EU-ETS 2 "and that, for the purpose of their activity, lack the means either to renovate the building they occupy, or to purchase zero- and low-emission vehicles or to switch to alternative sustainable modes of transport, including public transport, as relevant".
[30] According to Art. 2 (12) SCF Regulation (EU) 2023/955, "vulnerable transport users" are "individuals and households in transport poverty, but also individuals and households, including low income and lower middle-income ones, that are significantly affected by the price impacts" of the EU-ETS 2 "and lack the means to purchase zero- and low-emission vehicles or to switch to alternative sustainable modes of transport, including public transport".
[31] SCF Regulation (EU) 2023/955, Art. 3 (2) and Art. 8.
[32] Id., Art. 1 and Art. 7.
[33] Id., Art. 10 (1) in conjunction with ETS Directive 2003/87/EC, Art. 30d (4).
[34] SCF Regulation (EU) 2023/955, Art. 15.
[35] ETS Directive 2003/87/EC, Art. 30k.
[36] SCF Regulation (EU) 2023/955, Art. 10 (1) in conjunction with ETS Directive 2003/87/EC, Art. 30d (4).
[37] SCF Regulation (EU) 2023/955, Art. 14 in conjunction Annexes I and II.
[38] Id., Art. 4 (1).

income support to vulnerable households and vulnerable transport users to reduce the impact of the increase in the price of fossil fuels resulting from the EU-ETS 2.[39] The Social Climate Plan must entail, *inter alia*, an estimate of the likely effects of the increase in prices resulting from the EU-ETS 2 on households, in particular regarding energy and transport poverty, and on micro-enterprises,[40] as well as concrete measures and investments to reduce these effects[41]; information on existing or planned financing of measures and investments from other EU, international, public or, where relevant, private sources which contribute to the measures and investments set out in the Plan, including information on temporary direct income support[42]; envisaged milestones, targets and an indicative comprehensive timetable for the implementation of the measures and investments to be completed by 31 July 2032[43]; where applicable, a timetable for the gradual reduction of support for low-emission vehicles[44]; the estimated total costs of the Plan[45] and the envisaged national contribution to the estimated total costs of the Plan[46].

The Plans may include the following **measures and investments** to be designed for lasting impact: building renovation, in particular for vulnerable households and micro-enterprises occupying the worst-performing buildings, including for tenants and people living in social housing; access to affordable energy-efficient housing, including social housing; building decarbonisation, such as electrification of heating, cooling and cooking, through access to affordable and energy-efficient systems; integrating renewable energy generation and storage, including through renewable energy communities, citizen energy communities and other active customers to promote self-consumption of renewable energy; targeted information, education, awareness and advice on cost-effective measures and investments, available support for building renovations and energy efficiency and sustainable and affordable mobility and transport alternatives; access to zero- and low-emission vehicles and bicycles, including financial support or tax incentives; public and private infrastructure, including purchase of zero- and low-emission vehicles, recharging and refuelling infrastructure and development of a second-hand zero-emission-vehicles market; incentives to use affordable and accessible public transport; private and public entities developing and providing sustainable mobility on demand, shared mobility services and active mobility options.[47]

Member States may include in their Plans **direct income support for vulnerable households and transport users** to reduce the impact of the increase in road transport and heating fuel prices. Such direct support must (1) be temporary and decrease over time; and (2) represent no more than 37.5% of the estimated total cost of the Plan.[48]

39 Id., Art. 4 (3) and Art. 6 (1) (g).
40 Id., Art. 4 (3) and Art. 6 (1) (d).
41 Id., Art. 4 (3) and Art. 6 (1) (a).
42 Id., Art. 4 (3) and Art. 6 (1) (c).
43 Id., Art. 4 (3) and Art. 6 (1) (h).
44 Id., Art. 4 (3) and Art. 6 (1) (l).
45 Id., Art. 4 (3) and Art. 6 (1) (j).
46 Id., Art. 4 (3) and Art. 6 (1) (k).
47 Id., Art. 8 (1).
48 Id., Art. 8 (2).

2.1.5 Energy Taxation Directive (ETD)

As an integral part of the "Fit For 55" legislative package of July 2021, the Commission proposed[49] to revise the **Energy Taxation Directive 2003/96/EC (ETD)**[50]. It aims at contributing to achieving the EU climate targets for 2030 by taxing – and thereby pricing – energy sources more in line with their CO_2 emissions, to incentivise consumers to reduce their use of fossil forms of energy in general and of fuels and electricity for road transport in particular. Fuels would be taxed according to their "energy content" and "environmental performance" rather than their volume. Hence, fossil fuels such as gas oil and petrol would be taxed at the highest rate and electricity at the lowest rate.

However, the adoption of the proposal requires unanimity in the Council which has not been reached yet. In June 2024, the Belgian presidency concluded that the positions of the Member States remained divergent, requiring further work to reach an agreement.[51] Consequently, an essential element of the overall legislative framework for the decarbonisation of road transport by carbon pricing is still missing.

2.1.6 CO_2 Emissions Standards for Trucks and Buses

As part of the "Fit For 55" reforms, the EU legislators amended **Regulation (EU) 2019/1242** setting tighter **CO_2 emissions standards for new HDVs** (trucks and buses).[52] These are intended to contribute to achieving the EU 2030 climate target and climate neutrality by 2050 by increasing the share of zero-emission vehicles in the HDV fleet, while ensuring that innovation in and the competitiveness of the sector are preserved and enhanced.[53] The scope of the existing Regulation is expanded to make almost all new HDVs with certified CO_2 emissions – including smaller trucks, urban buses, coaches and trailers – subject to emission reduction targets.[54] Accordingly, CO_2 emissions from trucks and buses will have to be reduced – compared to the average CO_2 emissions of the reporting period of 2019 – in the period 2025-2029 by 15%, in the period 2030-2034 by 45%, in the period 2035-2039 by 65% and in the periods 2040 onwards by 90%.[55] Manufacturers of urban buses must ensure that their fleet of new vehicles includes a minimum share of zero-emission urban buses of 90% by 2030 and of 100% by 2035.[56]

2.1.7 Weights and Dimensions of Commercial Vehicles (W&D Directive)

The **Council Directive 96/53/EC (W&D Directive)**[57] governs the maximum authorised values applicable to commercial vehicles (i.e. trucks, buses, and their trailers) as regards to their dimensions (length,

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49 European Commission (2021), Proposal COM(2021) 563 for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast); see Menner, M. / Reichert, G. (2022), Fit for 55: Climate and Road Transport, cepPolicyBrief 06/2022.

50 Council Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity.

51 Council of the EU (2024), Ecofin report of 24 June 2024 to the European Council on tax issues, pp. 17 et seq.

52 Regulation (EU) 2024/1610 amending Regulation (EU) 2019/1242 as regards strengthening the CO_2 emission performance standards for new heavy-duty vehicles and integrating reporting obligations, amending Regulation (EU) 2018/858 and repealing Regulation (EU) 2018/956; European Commission (2023), Proposal COM(2023) 88 for a Regulation amending Regulation (EU) 2019/1242 as regards strengthening the CO_2 emission performance standards for new heavy-duty vehicles and integrating reporting obligations; see Menner, M. / Reichert, G. (2023), CO_2 Emission Targets for Lorries, Vans and Buses, cepPolicyBrief 13/2023.

53 Regulation (EU) 2019/1242, Art. 1. See also, e.g., Council of the EU, Press Release of 13 May 2024, Heavy-duty vehicles: Council signs off on stricter CO_2 emission standards; European Parliament, Press Release of 10 April 2024, MEPs adopt stricter CO_2 emissions targets for trucks and buses.

54 Regulation (EU) 2019/1242, Art. 2.

55 Id., Art. 3a.

56 Id., Art. 3d.

57 Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic [Weights and Dimensions (W&D) Directive 96/53/EC].

width, height) in national and international traffic[58], their weight in international traffic[59] and other characteristics such as axle weight in international traffic[60] as well as the requirements under which the Member States may grant exceptions to these maximum values. Accordingly, the Member States cannot prohibit the use of HDVs[61] that are permitted or put into circulation in another Member State and that comply with the maximum authorised weights and dimensions in international traffic or with the maximum authorised dimensions in national traffic. Based on an assessment of the W&D Directive [SWD(2023) 447][62], the Commission concluded that the current W&S Directive is inadequate in creating a level playing field within the EU internal market as well as in promoting the decarbonisation of commercial vehicles.[63] Together with its assessment, the Commission published a proposal to amend the W&D Directive 96/53/EC[64] which seeks to adapt and harmonise the requirements relating to the maximum dimensions and weights of HDVs in order to (1) offer companies strong incentives for the introduction of zero-emission technologies; (2) to facilitate the use of existing energy-saving solutions such as aerodynamic devices; (3) to further support "intermodal" freight transport by rail, inland waterways, and sea; and (4) to avoid distortions of competition. Until today, however, the EU legislators have not adopted the proposal for amending the W&D Directive yet.

2.1.8 Promotion of Renewable Energy (RED III)

As part of the "Fit for 55" reforms of the EU's energy and climate acquis, **Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources** was amended in 2023 (**RED III**).[65] It regulates the promotion of energy from renewable sources across the different sectors. To this end, RED III sets a binding target for the share of renewable energy in the EU's overall final energy consumption of 42.5% by 2030, with an additional 2.5% indicative top-up for achieving a target of 45%.[66] RED III includes, *inter alia*, rules on financial support for electricity from renewable sources and on flexibility provided by electric vehicles and batteries to the energy system by feeding renewable electricity into the grid when needed[67].

Furthermore, RED III sets rules for the use of renewables in the electricity, industrial, heating and cooling, and in the transport sector. For the transport sector, Member States must set an obligation on fuel suppliers to ensure that the amount of renewable fuels and renewable electricity supplied to the transport sector leads to either a share of renewable energy within the final consumption of energy in the transport sector of at least 29% by 2030, or to a reduction of GHG intensity of at least 14.5% by

58 Id., Annex 1 No. 1.
59 Id., Annex 1 No. 1; Annex I No. 2.
60 Id., Annex 1, No. 1; Annex I No. 3 and 4.
61 Id., Art. 3 (1).
62 European Commission (2023), Commission Staff Working Document SWD(2023) 447 accompanying the Proposal for a Directive of the European Parliament and of the Council amending Council Directive 96/53/EC.
63 Id., p. 2.
64 European Commission (2023), Proposal COM(2023) 445 for a Directive of the European Parliament and of the Council amending Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic; see Menner, M. / Reichert, G. (2023), Weights and Dimensions of Commercial Vehicles, cepPolicyBrief 16/2023.
65 Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (recast); European Commission (2021), Proposal COM(2021) 557 for a Directive amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652; Schwind, S. / Reichert, G. (2022), Fit for 55: Renewable Energies, cepPolicyBrief 01/2022.
66 Directive (EU) 2018/2001, Art. 3 (1).
67 Id., Art. 20a.

2030, compared to specific baseline[68] and by an indicative trajectory set by the Member State.[69] In addition, Member States must set an obligation on fuel suppliers to ensure that the combined share of advanced biofuels and biogas[70] and of renewable fuels of non-biological origin (RFNBO: renewable hydrogen and e-fuels produced from renewable hydrogen) in the energy supplied to the transport sector is at least 1% in 2025 and 5.5% in 2030, of which a share of at least 1 percentage point is from RFNBO in 2030.[71]

Overall, RED III leaves considerable leeway to the Member States for the design of specific measures for the implementation, e.g., of the obligations on fuel suppliers regarding the amount of renewable fuels and renewable electricity as well as the share of advanced biofuels, biogas and RFNBO in the energy supplied to the transport sector. Furthermore, no obligations are set in this respect beyond 2030. Consequently, it would then be up to the EU-ETS 2 to provide incentives for further reductions in the GHG content of fuels, provided that its price signal is strong enough.

2.1.9 Alternative Fuels Infrastructure Regulation (AFIR)

As part of the "Fit for 55" reforms of the EU's energy and climate acquis, the EU enacted the new **Regulation (EU) 2023/1804 on the deployment of alternative fuels infrastructure (AFIR)** which repeals Directive 2014/94/EU and is applicable as of 13 April 2024[72]. To achieve the EU's climate targets, AFIR establishes mandatory national targets with the objective of deploying sufficient publicly accessible infrastructure for alternative fuels – especially electricity and H_2 – to support the uptake of alternative fuel vehicles across all transport modes (road vehicles, trains, vessels, and stationary aircraft).[73] With regards to the recharging infrastructure for HDVs, Member States must ensure a minimum coverage of recharging points:[74] By the end of 2030, Member States must ensure that publicly accessible hydrogen refuelling stations for road vehicles with a total capacity of at least 1 tonne per day are deployed at least every 200 km along the TEN-T core network. At least one refuelling station must be deployed in each urban node.[75] Until the end of 2024, Member States must ensure that an appropriate number of publicly accessible refuelling points for liquefied methane for road transport are set up, at least along the TEN-T core network, where there is demand, unless the costs are disproportionate to the benefits.[76]

2.2 EU-ETS 2 Functions and Advantages within the EU Regulatory Framework

Within the EU regulatory framework for the decarbonisation of road transport in general and the reduction of GHG emissions of HDVs in particular, the future **EU-ETS 2 plays a pivotal role** since it features **distinct advantages in comparison to other instruments**. In general, three main regulatory

68 Id., Art. 27 (1) (b).
69 Id., Art. 25 (1) (a).
70 Id., Annex IX Part A.
71 Id., Art. 25 (1) (b).
72 Directive 2014/94/EU on the deployment of alternative fuels infrastructure; European Commission (2021); European Commission (2021), Proposal COM(2021) 559 for a Regulation on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU; see Menner, M. / Reichert, G. (2022), Fit for 55: Climate and Road Transport, cepPolicyBrief 06/2022.
73 Regulation (EU) 2023/1804, Art. 1 (1).
74 Id., Art. 4 (1).
75 Id., Art. 6.
76 Id., Art. 8.

approaches and respective types of instruments can be distinguished in EU climate policy: (1) "command-and-control" requirements, (2) subsidies and (3) carbon pricing:[77]

(1) **Command-and-control requirements** impose obligations directly on potential GHG emitters or the manufacturers of corresponding products. Breaches of requirements are usually sanctioned by fines. Regulation (EU) 2019/1242 setting tighter CO_2 emissions standards for new HDVs is a typical example of this regulatory approach.

(2) **Subsidies** are an attempt to influence the behaviour of potential GHG emitters, not directly by command-and-control requirements, but indirectly by financial incentives promoting low-carbon alternatives. For example, the promotion of renewable energy or the purchase of low-carbon products, such as cars and trucks, can be subsidised by the Member States in line with the respective State Aid requirements of the EU.

(3) **Carbon pricing** is implemented either through carbon taxes or emissions trading systems (ETS) by putting a price on GHG emissions. In line with the polluter-pays principle[78], GHG emitters are held financially responsible for the negative effects of climate change on third parties, so that they incorporate related costs in their calculations ("internalisation of external costs"). In the case of a **carbon tax**, the carbon price is set by the state. In case the Commission proposal[79] for the revision of the Energy Taxation Directive 2003/96/EC (ETD) is adopted by the EU legislators[80], energy will be priced more in line with the associated CO_2 emissions to incentivise consumers to reduce their use of fossil fuels for road transport. Within a **cap-and-trade ETS**, the carbon price is determined by (1) setting an overall cap on the maximum amount of allowed GHG emissions, which is gradually reduced to finally achieve the targeted emissions reduction, and (2) by the interplay of demand and supply of trading the increasingly scarce emission allowances on the market.

    In the cases of a carbon tax and of an ETS, the price signal aims to give GHG emitters a financial incentive for changing their conduct. This may be the reduction of GHG-emitting activities – such as using fossil fuels for HDVs – as the carbon price will make carbon-intensive goods and services relatively more expensive. Furthermore, carbon pricing can increase the demand for low-carbon technologies and carbon-reducing measures – e.g., fuel-efficient engines – and thus stimulate corresponding investments which will also be profitable without the need for expensive subsidies. In contrast to subsidies, carbon pricing does not require public funds, but generates revenue, which in turn can be used to promote further decarbonisation measures.

A well-designed and balanced **mix of different types of instruments** can be suitable to foster enabling conditions for the transformation[81], e.g., to subsidise research and development of innovative low-carbon technology or to overcome the chicken-and-egg problem to synchronise the roll-out of new technologies with the needed infrastructure, e.g. in the case of the AFIR Regulation (EU) 2023/1804,

77 For the following see Reichert, G. / Menner, M. / Schwind, S. (2024), Future EU Climate Policy: Challenges and Chances, cepInput, pp. 8 et seq.; Menner, M. / Reichert, G. / Voßwinkel, J. (2019), Wirksame CO_2-Bepreisung, cepStudie, pp. 5 et seq.; Menner, M. / Reichert, G. (2019), CO_2-Steuer oder Emissionshandel?, cepAdhoc, pp. 4 et seq.

78 TFEU, Art. 191 (2).

79 European Commission (2021), Proposal COM(2021) 563 for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast); see Menner, M. / Reichert, G. (2022), Fit for 55: Climate and Road Transport, cepPolicyBrief 06/2022.

80 Council Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity.

81 See, e.g., Vöpel, H. / Wolf, Á., Reichert, G. (2023), Dekarbonisierung ohne Deindustrialisierung – Ein ordnungspolitischer Rahmen für die Transformation in eine klimaneutrale Marktwirtschaft, cepStudie, p. 28.

or to address social impacts, e.g. by SCF Regulation (EU) 2023/955. Overall, **carbon pricing in general and emissions trading in particular have proven to be the key instruments** in EU climate policy. This notion is supported by the experience made since 2005 regarding the attainment of the EU climate target for the year 2020 of 20% GHG emissions reductions compared to 1990. The target could only be achieved due to the fact that sectors under the EU-ETS 1 – including energy production and energy-intensive industries – were capable of delivering much stronger GHG emissions cuts than the under-performing other sectors, including road transport.[82] In the latter, national reduction targets had been pursued less successfully with command-and-control requirements and subsidies as the dominating instruments.

Given this experience with the different regulatory approaches, we stipulate that to be capable of achieving all three objectives of EU climate policy – (1) reducing GHG emissions by decarbonisation, (2) securing energy supply, and (3) providing affordable energy prices – climate instruments should be simultaneously **(1) ecologically/climatically effective** by actually reducing GHG emission, **(2) economically cost-efficient**, **(3) socially acceptable**, and also **(4) politically resilient** even in times of crisis. Measured against these criteria, carbon pricing in general and the EU-ETS 2 in particular have significant advantages over command-and-control requirements and subsidies:

(1) Firstly, carbon pricing is better suited for effectively reducing GHG emissions (**ecological/climatical effectiveness**), the very purpose of climate policy. This is because the carbon price signal is directly aimed at the GHG-emitting behaviour itself and – if it is strong enough – can fully develop its steering effect on the emitter. For example, by increasing the price of fossil fuels, carbon pricing in road transport through the EU-ETS 2 directly targets the actual consumption of fossil fuels and the associated GHG emissions of HDVs. By reducing the Total Cost of Ownership (TCO) of zero- and low-emission HDVs relative to fossil-fuelled vehicles, the price signal generated by the EU-ETS 2 will directly incentivise the rollout of less carbon-intensive HDVs.[83] In turn, a potential failure of the EU-ETS 2 to deliver a sufficiently high carbon price in road transport could lead to a persistent TCO disadvantage for climate-friendly HDVs.[84]

Furthermore, by making fossil fuels more expensive, carbon pricing automatically covers the entire vehicle fleet, whereas CO_2 emission performance standards are only binding for new HDVs. If carbon pricing is implemented in road transport by the EU-ETS 2, an overall cap on the maximum amount of allowed GHG emissions is set and gradually reduced. This is climatically the most effective way to guarantee the attainment of the targeted emissions reduction in the sectors covered by the EU-ETS 2 in comparison to command-and-control requirements, subsidies, and carbon taxes.

Finally, carbon pricing counteracts counter-productive "rebound effects". These can arise when technical efficiency improvements in GHG-emitting activities – e.g., in the form of lower fuel

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[82] European Environment Agency EEA (2021), News Article of 26 October 2021, EU achieves 20-20-20 climate targets. EEA (2021), Trends and Projections in 2021, pp. 14 et seq., p. 21: "Achievements in emission reductions since 2005 are diverse at the sectoral level. The highest reductions are observed in the energy supply sector, where emissions decreased by 43% between 2005 and 2020. Considerably greater efforts are needed in the transport and agricultural sectors, where emissions fell by only 14% and 2%, respectively."

[83] Menner, M. / Reichert, G. / Voßwinkel, J. / Wolf, Á. (2025), Towards Decarbonised Road Transport Driven by a Globally Competitive EU Automotive Industry, cepStudy, pp. 73 et seq.

[84] Id., p. 8.

consumption per kilometre due to CO_2 emission performance standards for HDVs[85] – reduce usage costs. This is because these efficiency gains can, in turn, lead to an increase in the now cheaper utilisation and thus to GHG emissions not decreasing to the desired extent or even increasing. This is counterproductive in terms of ecological/climatic effectiveness and economically inefficient. Moreover, in a cap-and-trade ETS, such as the future EU-ETS 2, any overall rebound effect is prevented by the cap.[86]

(2) Secondly, reducing GHG emissions as cost-efficiently as possible is important. **Economic cost-efficiency** determines the international competitiveness of the European economy regarding the additional cost of climate protection in comparison to the competitors from third countries both in world markets and in the domestic EU internal market. Ultimately, reducing GHG emissions at the lowest possible cost and a successful European economy are crucial to securing social prosperity and peace.

In this respect, carbon pricing in general and the EU-ETS 2 in particular are more cost-efficient than command-and-control requirements and subsidies. This is because the uniform carbon price in the sectors covered tends to equalise the costs of avoiding additional GHG emissions ("marginal avoidance costs") and the most cost-efficient GHG avoidance options are realised: On the one hand, those who can avoid GHG emissions at a lower cost than the carbon price will try to reduce their GHG emissions in order to avoid having to pay the carbon price. On the other hand, those whose avoidance costs are higher than the carbon price will be willing to pay it. In this way, the most cost-efficient GHG emissions avoidance options are automatically identified, thus overall avoiding GHG emissions at the lowest cost.

Command-and-control requirements and subsidies do not have this cost-reducing effect because they do not equalise marginal avoidance cost. They are, therefore, unnecessarily expensive. This ultimately leads to less GHG emissions being avoided with the resources used than would be possible. This in turn is counterproductive regarding the very aim of climate policy to reduce GHG emissions. Furthermore, carbon pricing eliminates the need for many additional, ecologically/climatically ineffective and economically inefficient, command-and-control requirements and subsidies. This is because the higher prices for fossil fuels already make lower-carbon energies and technologies relatively cheaper and behavioural changes more lucrative. In contrast, double regulation generates unnecessary additional costs.

(3) Thirdly, putting a price on GHG emissions through the future EU-ETS 2 undeniably is a significant financial burden which finally must be paid by the consumer. This certainly raises the question of **social acceptability**.

Indeed, carbon pricing makes the cost of climate protection measures very transparent. However, this does not mean that other climate instruments do not come without a big price tag – quite to the contrary. As demonstrated above, command-and-control requirements and subsidies are both less ecologically effective and economically cost-efficient than carbon pricing, which by itself already raises the question of whether the unnecessary cost they cause to society is acceptable.

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85 On the rebound effect in German road transport, see Frondel, M. et al. (2009), Fuel Efficiency and Automobile Travel in Germany: The Rebound Effect, in: Hering, H. et al. (eds.), Energieeffizienz und nachhaltiger Konsum – Der Rebound-Effekt, pp. 47-66.

86 See Menner, M. / Reichert, G. (2022), Fit for 55: Climate and Road Transport, cepPolicyBrief 06/2022, p. 15.

While subsidies are understandably more popular, because superficially they seem to be less painful to individuals than having to pay a carbon price, in the end the respective bill still must be paid by society as a whole. After all, subsidies are government expenditure that must be counter-financed by making debts or increasing government revenue, e.g., by the taxation of labour, both of which finally reduce the overall prosperity of a society.

In contrast to subsidies, carbon pricing does not require public funds, but generates revenue. This could be redistributed to the population – e.g., in the form of a "climate dividend"[87] – to cushion the financial burden of climate protection measures in general and carbon pricing in particular, in order also to sustain public acceptance and support for EU climate policy. This is one of the main aims of the new Social Climate Fund, which is financed by EU-ETS 2 revenues.

(4) Fourthly, continued public support is essential for EU climate policy to be **politically resilient**. Political instability is toxic in a policy field which is pursuing long-term targets, and which is therefore inherently dependent on the credibility and foreseeability of the corresponding legal framework and its implementation by the EU and its Member States. In today's European policy discourse, "resilience" refers to the ability to withstand and cope with shocks and persistent structural changes, and also to adapt if necessary.[88] Only if EU climate policy provides such political resilience in the form of regulatory stability and the provision of sufficient planning security for companies, investors and consumers alike, combined with a certain degree of adaptability, especially in times of crisis, it will be capable of pursuing its long-term objectives.[89]

A climate instrument provides planning security if companies, investors, and consumers can count on its continued existence in their production, investment and buying decisions. At first sight, command-and-control requirements seem to offer the highest degree of planning security. However, if strict provisions clash with harsh economic realities – leading to sinking profits, lower wages or even the closing of production plants – political pressure on EU decision-makers could grow to loosen even already enacted legislation.

While it may not be surprising that unpopular command-and-control requirements are watered-down or even abolished to give in to significant public pressure, popular subsidies do not offer more planning security either. Often Member States can finance subsidies for climate measures only through increasing public debt. In view of the tense budgetary situation in many Member States for the foreseeable future, it is unlikely that subsidies will be widely available for climate policy. Consequently, they do not offer reliable planning security in the medium and long term. Furthermore, this can even be the case in the short term, as recent events in Germany have shown: After the German constitutional court had ruled that it was unconstitutional to reallocate 60 billion € in unused debt unlocked during the COVID-19 pandemic to a Climate and Transition Fund[90],

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87 See, e.g., Menner, M. / Voßwinkel, J. / Reichert, G. (2023), Das Klimageld als Chance für einen klimapolitischen Neuanfang – Optionen für eine wirksame Ausgestaltung und EU-konforme Finanzierung, cepInput 15/2023.

88 European Commission (2020), 2020 Strategic Foresight Report – Charting the Course Towards a More Resilient Europe, pp. 5 et seq.; European Commission / Joint Research Centre (2017), Building a Scientific Narrative Towards a More Resilient EU Society – Part 1: A Conceptual Framework, p. 5.

89 For the following see Menner, M. / Reichert, G. (2020), EU Climate Policy in Light of the Corona Crisis – Which climate-policy instruments are crisis-resistant, and which are not?, cepInput 18/2020, pp. 6 et seq.

90 Politico of 15 November 2023, Top court blows €60B hole in Germany's climate financing plans.

in December 2023 the German government abruptly stopped subsidies for the purchase of new electric cars.[91]

Regarding carbon pricing, the picture is mixed. In December 2018, the "yellow vest protests" forced the French government to withdraw the planned increase of the carbon price on fuels.[92] In October 2022, in the midst of the energy crisis and soaring energy prices following the Russian invasion of Ukraine, the German government temporarily suspended the 2023 increase of the carbon price for fossil fuels in the heating and transport sectors (BEHG).[93] Carbon taxes are the first unpopular measures to be put on hold in times of economic crisis. In contrast to command-and-control requirements, subsidies and carbon taxes, however, a cap-and-trade ETS such as the future EU-ETS 2, at least in theory, provides a comparatively high degree of foreseeability and planning security.[94] First, since by its very nature an ETS is a rule-based system designed for the attainment of a long-term goal, it is in principle less vulnerable to abrupt regulatory interventions. Given that the desired GHG reduction target is effectively and automatically achieved by gradually reducing the cap of tradeable emission allowances, there is no ecological/climatic need for adjustments (such as incremental manipulations of a carbon price) even in an economic crisis. Furthermore, although the carbon price is volatile, it can be expected to rise in the long run as allowances will become ever scarcer. However, as the current discussions show (see below section 2.4), these advantages are nevertheless at risk if the political pressure for fundamental modifications of the instrument itself is very high.

In sum, in comparison to other climate instruments such as subsidies and command-and-control requirements, e.g. CO_2 emissions standards for new HDVs, **carbon pricing in general and the future EU-ETS 2 in particular are simultaneously more ecologically effective, economically cost-efficient, socially acceptable, and**, at least in principle as a rule-based instrument, **politically resilient**. Given these distinct advantages, the future EU-ETS 2 will play a pivotal role within the EU regulatory framework for the decarbonisation of road transport.

2.3 Implementation of the EU-ETS 2 Regulatory Framework

Despite the pivotal role of the EU-ETS 2 within the overall EU regulatory framework for the decarbonisation of road transport and its considerable advantages in comparison to other policy approaches, already before its start the instruments is faced with growing concerns regarding the social impact of rising fuel prices especially on vulnerable groups, which could eventually undermine acceptance of climate action measures in general. This scepticism materialises, *inter alia*, in **extensive delays of the EU-ETS 2 transposition into national law** by almost all Member States, thereby jeopardising the overall **EU-ETS 2 implementation schedule** with its interdependent consecutive deadlines:

91 Clean Energy Wire of 18 December 2023, Abrupt end to German electric car subsidies fuels doubts about green mobility target.

92 The Guardian of 5 December 2018, Macron scraps fuel tax rise in face of gilets jaunes protests; Hanafi, O. et al. (2019), Carbon Pricing in France and Germany – Differences, Similarities and Perspectives, cepInput 11/2019, p. 9.

93 Bundesministerium für Wirtschaft und Klimaschutz BMWK (2022), Press Release of 28 October 2022, Erhöhung des CO_2-Preises wird 2023 ausgesetzt.

94 Menner, M. / Reichert, G. (2020), EU Climate Policy in Light of the Corona Crisis – Which climate-policy instruments are crisis-resistant, and which are not?, cepInput 18/2020, p. 11.

- 05.06.2023: revised ETS Directive 2003/87/EC enters into force
- 31.12.2023 Member States to notify national carbon tax
- **30.06.2024: Member States to transpose EU-ETS 2 into national law**
- **01.01.2025: Start of EU-ETS 2 monitoring**
  Commission to publish the EU-ETS 2 cap for 2027[95]
- 30.04.2025: Regulated entities to report historical emissions
- **30.06.2025: Member States to submit Social Climate Plan**
- 15.07.2026: Commission to publish energy prices for the first half of 2026
- 31.07.2026: Commission review of ETS Directive 2003/87/EC
- **01.01.2027: EU-ETS 2 starts in case of no exceptionally high energy prices**
- 30.06.2027: Commission to publish EU-ETS 2 cap for 2028
- 01.01.2028: Commission review of the EU-ETS 2
  EU-ETS 2 starts in case of exceptionally high energy prices
- 30.04.2028: Regulated entities first report on costs passed to consumers
- **31.05.2028: First deadline for surrendering EU-ETS 2 allowances**
- **31.12.2029: Commission to assess 45 € threshold to trigger MSR**
- 31.10.2031: Commission to assess integration of EU-ETS 1 and EU-ETS 2

Accordingly, the **Member States had to transpose the EU-ETS 2 into their national legislation by 30 June 2024** at the latest. This is a prerequisite for the following implementation steps, such as the start of emissions monitoring by regulated entities as of 1 January 2025 and of reporting historic emissions as of 30 April 2025. Delays in the national transposition pose serious challenges for the preparations of authorities and regulated entities to make the EU-ETS 2 work properly without major hiccups once it becomes fully operational in January 2027.

However, **with the exception of Austria**, **26 Member States failed to fully transpose the EU-ETS 2 into national law by 30 June 2024**.[96] Consequently, the Commission opened **infringement proceedings** according to Art. 258 and 260 Treaty on the Functioning of the European Union (TFEU) by sending a formal notice to the Member States concerned.[97] In the absence of a satisfactory response, the Commission could decide to issue a reasoned opinion. If Member States still do not fulfil their obligation for the national transposition of the EU-ETS 2, the Commission could bring a case before the Court of Justice of the European Union (CJEU), which could result in substantial penalty payments. The Commission closed the infringement cases, e.g., for Greece and Ireland in December 2024, and for Sweden and Denmark in February 2025.[98] In **Germany**, the revised Greenhouse Gas Emissions Trading Act (TEHG) entered into force on 6 March 2025, thereby providing the legal basis for the application of the EU-ETS 2 in Germany.[99] The TEHG European Law Adaptation Act 2024[100] transposes the revised ETS Directive 2003/87/EC into national law and introduces specific rules for EU-ETS 2 obligations,

95 Commission Decision (EU) 2024/2951 on the Union-wide quantity of allowances to be issued under the EU ETS for buildings, road transport and additional sectors for 2027.

96 European Parliamentary Research Service (May 2025), EU emissions trading system for buildings, road transport and additional sectors (ETS2) – Status and concerns, p. 6.

97 European Commission, Press Release of 25 July 2024, Commission takes action to ensure complete and timely transposition of EU directives.

98 European Parliamentary Research Service (May 2025), EU emissions trading system for buildings, road transport and additional sectors (ETS2) – Status and concerns, p. 6.

99 See also wts global, 10 April 2025, Guide to National Implementation of EU Emissions Trading System 2, p. 11.

100 Gesetz zur Anpassung des Treibhausgas-Emissionshandelsgesetzes an die Änderung der Richtlinie 2003/87/EG (TEHG-Europarechtsanpassungsgesetz 2024), Bundesgesetzblatt I Nr. 70.

reporting duties, and the definition of liable parties. With the legal framework now in place, the German Emissions Trading Authority (Deutsche Emissionshandelsstelle DEHSt) and other responsible bodies can proceed with reviewing monitoring plans and issuing emissions permits. **By early September 2025, only 18 Member States had notified their national transposition of the EU-ETS 2**[101], with the remaining eight Member States – **Bulgaria, Estonia, Spain, France, Latvia, Hungary, Poland, and Portugal – still missing**.

Similarly, the development of the national **Social Climate Plans** is also way behind schedule. The deadline for the submission of the Plans expired on **30 June 2025**. As of early September 2025, no Social Climate Plans were publicly available on the European Commission's website.[102] Like others, **Germany** has not submitted its Social Climate Plan yet. In this respect, the German Environment Ministry declared that "like us, most Member States will need more time […]. The German Government's aim is to present the plan this year, the sooner the better. Assumptions that Germany would lose funds as a result of the delay are unfounded".[103] An analysis published in mid-June 2025[104], which examines the development of the Social Climate Plans in eight Member States, revealed uneven progress, persistent transparency gaps, weak stakeholder engagement, and protracted delays.[105] Nevertheless, **Estonia** and **Poland** have already published at least their draft plans. The Estonian draft plan prioritises the housing sector, dedicating 76% of its Social Climate Fund allocation to building renovations and social housing, with 21% going to public transport services. Poland's draft plan dedicates up to 37% of its allocation to direct income support, 39% to housing measures, and 21% to public transport. **Romania** and **Latvia** show good practice in the development of their plans regarding early stakeholder engagement and transparency. Romania's plan is expected to include support for heat pumps, building insulation, and energy communities, while Latvia's government is exploring renovation of social housing, demand-based public transport, electric vehicle and bike leasing schemes. **Slovakia** is set to prioritise investments in energy efficiency and public transport, with the largest allocations going to family house renovations, social housing and crisis facility upgrades, and apartment renovations. However, other countries show no progress at all. **Hungary** and **Bulgaria** have not presented any draft plans, have not conducted structured public consultations, and have unclear investment strategies. **Italy** has also not revealed any details of its plan yet.

The individual **conditions for the implementation of the EU-ETS 2 Regulatory Framework vary considerably between Member States** dependent on a multitude of socio-economic factors (income, energy mix, level of energy prices, set-up of the transport and heating system, etc.). Consequently, as the price for EU-ETS 2 allowances will be the same across the EU, its impact will be different in the Member States. In countries such as **Bulgaria**, **Romania**, and **Hungary**, where the median monthly net income is around 600 €, citizens will have to spend a higher proportion of their income to cover the increase of heating and transportation costs caused by the EU-ETS 2 compared to those in **Germany**, **France** or **Finland**, where monthly incomes exceed 2,000 €.[106] Energy poverty is a substantial problem not only,

[101] EUR-Lex, National transposition measures communicated by the Member States concerning: Directive (EU) 2023/959 amending the ETS Directive 2003/87/EC and MSR Decision (EU) 2015/1814. See also wts global, 10 April 2025, Guide to National Implementation of EU Emissions Trading System 2.

[102] European Commission, Social Climate Fund.

[103] Bundesumweltministerium, 30 June 2025, BMUKN-Stellungnahme zum EU-Klimasozialfonds.

[104] Bankwatch Network & E3G (2025), Climbing together: Is the Social Climate Fund working for those who need it most?

[105] Bankwatch Network, 13 June 2025, Vulnerable households at risk: Central and eastern European countries struggle to finalise national social climate plans.

[106] Gagnebin, M., Agora Energiewende, 20 March 2025, Why early action by five countries is key to ETS 2 success.

but especially in Central and Eastern Europe.[107] Furthermore, regional income disparities also exist within countries. For example, rural residents, making up approximately 23% of the EU population and often lacking alternatives to private cars, will be more exposed to carbon pricing by the EU-ETS 2 than urban dwellers.[108] Overall, however, **the reluctant transposition of the EU-ETS 2 provisions into national law as well as the delayed development of the national Social Climate Plans** in almost all Member States can be ultimately attributed to a core reason playing an essential role across Europe: In contrast to other climate instruments, carbon pricing of fossil fuels in road transport and buildings sectors by the EU-ETS 2 makes the cost of climate protection measures very transparent and has a **direct and very noticeable impact on citizens' daily lives. This makes the EU-ETS 2 economically and socially very sensitive, highly politicised** and even prone to be used by populists to question EU climate policy in general.[109] No wonder that with its actual application in 2027 rapidly approaching, governments are becoming increasingly concerned.

2.4 Growing Pressure to Revise the EU-ETS 2 Regulatory Framework

The European Commission will use the data on energy prices **in the first half of 2026 to determine if the EU-ETS 2 must be delayed by one year, from 2027 to 2028**. However, even before the data is available in mid-2026, several Member States have already advocated for postponing the start of the EU-ETS 2 at least until 2028 or even questioned the introduction of the instrument altogether.[110]

- In September 2024, the Slovakian Environment Minister Tomáš Taraba highlighted that **Slovakia**[111] would not implement price increases for heating, petrol or diesel at this stage and urged the Commission to reconsider the ETS Directive regarding the forthcoming EU-ETS 2. "As for this new emission system, we will consult it with other Member States," Taraba said. "We will raise the issue in Brussels, as not all costs should be borne by citizens".

- In December 2024, the **Czech Republic** called for a delay of the EU-ETS 2.[112] The Czech Prime Minister Petr Fiala announced that the Czech Government would try to "persuade our counterparts in the EU to join our proposal to postpone the entry into force of the EU-ETS 2 until 2028, by which time we want to introduce stronger protection against the sharp rise in energy prices" so that they do not have a negative impact on the economy.

- Following the Czech initiative, **Poland**[113] went even further, asking in December 2024 for a three-year delay of the EU-ETS 2. In the view of the Polish Government, such a delay should, however, not jeopardise the launch of the Social Climate Fund, which should be operational before the start of the EU-ETS 2.

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107 Lukács, A., Challenges to the Implementation of ETS2 and the Social Climate Fund, 30 April 2025, European Climate Initiative (EUKI).
108 Gagnebin, M., Agora Energiewende, 20 March 2025, Why early action by five countries is key to ETS 2 success.
109 Lukács, A., 30 April 2025, European Climate Initiative (EUKI), Challenges to the Implementation of ETS2 and the Social Climate Fund.
110 European Parliamentary Research Service (May 2025), EU emissions trading system for buildings, road transport and additional sectors (ETS2) – Status and concerns, p. 6.
111 Euractiv, 9 September 2024, Slovak Environment Minister rejects EU directive on household fossil fuel charges.
112 Euractiv, 17 December 2024, Czechia wants to delay ETS 2 until at least 2028.
113 European Parliamentary Research Service (May 2025), EU emissions trading system for buildings, road transport and additional sectors (ETS2) – Status and concerns, p. 6.

- In March 2025, the Parliament of **Estonia**[114] went as far as to grant the Estonian Government a mandate to push for the abolishment or at least postponement of the EU-ETS 2, because of the administrative burden and uncertainty posed by transposing the measure. If Estonia fails to garner sufficient support, it will join the initiatives of the Czech Republic and Poland to postpone the introduction of EU-ETS 2. According to Estonia, this additional time should be used to find a way to limit the burden of imposing the measure.

Despite these initiatives, **in May 2025 the Commission reaffirmed its commitment to launch the EU-ETS 2 in 2027**[115], stressing that the respective "legislation is already adopted and in force" and that no revision is planned before the review scheduled by the ETS Directive 2003/87/EC only for January 2028.[116] In the meantime, however, the number of Member States calling for a review of the EU-ETS 2 has increased considerably. On 2 July 2025, the Czech Government sent a **"joint non-paper" signed by 18 Member States** – including, e.g., Germany, Italy, Spain, and Poland – to the Commission which sketches out **options for modifications of the EU-ETS 2 regulatory framework**.[117] The group of Member States proposes (1) the regular publication of information facilitating forecasts for EU-ETS 2 allowance prices; (2) an earlier start of auctions already in 2026 to reduce price uncertainty in 2027; adjustments to the MSR (3) by smoothing the MSR trigger to limit price volatility and (4) by extending its lifetime beyond 2032 so that the allowance price from 2033 onwards does not increase and remains stable; and (5) the reinforcement of price control mechanisms by "strengthening" the current "soft price cap" of 45 € above which additional allowances would be released to the market to lower the price. Although a postponement or even abolishment of the EU-ETS 2 as advocated for by Slovakia, the Czech Republic, Poland and Estonia did not find sufficient support, the Czech Prime Minister Petr Fiala stressed that the proposals of the joint non-paper are backed by a **qualified majority of Member States** represented in the Council of the EU, "clearly showing that our concerns are not isolated". "We are doing our utmost to ensure that EU climate policy is not only ambitious but also socially acceptable, economically sensible, and does not have a negative impact on our households or businesses," he added.

One reason for political opposition to the EU-ETS 2, particularly among some Eastern Member States, is that the energy transition of their residential sectors is still in a comparatively early stage. For example, despite some progress in recent years, a significant proportion of households in Poland and, to a lesser extent, the Czech Republic still rely on solid fossil fuels (both lignite and hard coal) for heating (see Figure 2). Due to their GHG emission intensities, these energy carriers are expected to face the most drastic price increases following the implementation of the EU-ETS 2.

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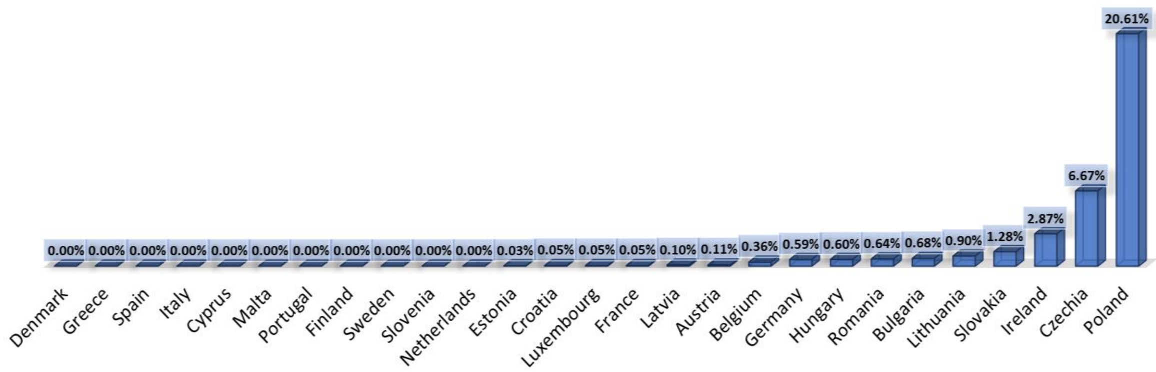
114 ERR News, 13 March 2025, Estonia to move for postponing ETS2 regulation; Argusmedia, 24 March 2025, Estonian climate ministry to push for EU ETS 2 repeal.

115 Carbon Pulse, 5 May 2025, EU Commission stresses no ETS2 review before 2028.

116 ETS Directive 2003/87/EC, Art. 30i.

117 Government of the Czech Republic, 2 July 2025, The Czech Republic has sent requirements from 18 EU member states to the European Commission regarding changes to emissions trading.

Figure 2: Share of solid fossils in residential final energy consumption in 2023



Source: Eurostat (2025)[118].

2.5 Requirements and Opportunities for EU-ETS 2 Revisions

A postponement of or any other revisions of the EU-ETS 2 regulatory framework – such as those proposed by the group of 18 Member States in their "joint non-paper" of July 2025 – would require the Commission to make legislative proposals to amend, e.g., the ETS Directive 2003/87/EC or other related legal acts such as the MSR Decision (EU) 2015/1814. Only the Commission has the legal power to initiate the necessary **ordinary legislative procedure**.[119] While the European Parliament and the Council can call on the Commission to propose amendments, they do not have the legal power to open the procedure for an EU-ETS 2 revision by themselves or legally force the Commission to do so.

As mentioned, the ETS Directive 2003/87/EC foresees a **review of the EU-ETS 2 only by 1 January 2028**.[120] Accordingly, the Commission must at the latest by that date send a report to the European Parliament and to the Council on the implementation of the EU-ETS 2 provisions with regard to their effectiveness, administration and practical application, including on the application of the rules under MSR Decision (EU) 2015/1814. If the Commission arrives at the conclusion that changes to the framework would be appropriate, it can accompany its report with a **legislative proposal** for the necessary amendments. However, the Commission is not prohibited from initiating amendments to the EU-ETS 2 regulatory framework before 1 January 2028 if it comes to the conclusion that such changes at an earlier date would be appropriate. In this respect, the current initiative of a qualified majority of 18 Member States could exert at least considerable **political pressure on the Commission to review the EU-ETS 2 provisions and propose amendments any time before the 2028 review deadline**.

Furthermore, as co-legislators, the European Parliament and the Council could try to use an ordinary legislative procedure initiated by the Commission for the revision of the EU-ETS regulatory framework to introduce additional desired changes which were not part of the Commission's initial legislative proposal. **Revision opportunities** for such initiatives could arise in the context of various reviews prescribed by the ETS Directive. For example, by 31 July 2026 at the latest, the Commission must report to the European Parliament and the Council on how "negative GHG emissions" that are removed from

[118] Eurostat (2025). Disaggregated finale energy consumption in households. Eurostat Database.
[119] Treaty on European Union (TEU), Art. 17 (2) in conjunction with TFEU, Art. 294 et seq.
[120] ETS Directive 2003/87/EC, Art. 30i.

the atmosphere and safely and permanently stored could be accounted for and how they could be covered by emissions trading.[121] Also by 31 July 2026 at the latest, the Commission must report to the European Parliament and the Council on the feasibility of including municipal waste incineration installations in the EU-ETS 1.[122] In such cases, the Commission can make legislative proposals if it deems them to be appropriate. However, in case the co-legislators should try to use such revision opportunities for additional amendments going far beyond the Commission's initial legislative proposal, it is ultimately up to the Commission itself to decide whether to accept them or not. After all, the Commission can, under specific conditions, withdraw a legislative proposal altogether, thereby terminating the respective legislative procedure.[123]

[121] ETS Directive 2003/87/EC, Art. 30 (5).

[122] Id., Art. 30 (7).

[123] Court of Justice of the European Union (CJEU), C-409/13, *Council v Commission*, ECLI:EU:C:2015:217, para. 83. Accordingly, the CJEU clarified that "where an amendment planned by the Parliament and the Council distorts the proposal for a legislative act in a manner which prevents achievement of the objectives pursued by the proposal and which, therefore, deprives it of its *raison d'être*, the Commission is entitled to withdraw it. It may, however, do so only after having due regard, in the spirit of sincere cooperation which, pursuant to Article 13 (2) TEU, must govern relations between EU institutions in the context of the ordinary legislative procedure […], to the concerns of the Parliament and the Council underlying their intention to amend that proposal".

3 Economic Analysis of Modification Options for EU-ETS 2

To achieve a smooth entry into operation and reduce implementation risks, the EU co-legislators agreed upon a specific set of market design features for the EU-ETS 2 (see above sections 2.1.3 and 2.1.4) which are partly transitory in nature. In this respect, the "joint non-paper" signed by 18 Member States (see above section 2.4) sketches out modification options with regard to these design features and also proposes additional approaches. In the following, we analyse potential modification options currently discussed from an economic point of view.

3.1 Overview of Discussed Modification Options

3.1.1 Improvement of the Information Base

One concern with regard to the start of trading in the EU-ETS 2 is that insufficient information for market participants about emission avoidance costs and price sensitivities of end users could lead to strongly fluctuating allowance prices in the initial phase. This would contribute to uncertainty about the future level of CO_2 prices and could encourage a wait-and-see attitude with regard to urgently needed decarbonisation investments. The lack of international role models concerning combined emissions trading for the road transport and buildings sectors exacerbates this problem. The ex-ante trading of EU-ETS 2 futures contracts, which is currently in its start-up phase, provides only limited price signals, as initial trade volumes are limited and contracts have expiry dates not earlier than December 2027.[124] Measures to improve the information situation could include the regular centralised provision of relevant market information by the European Commission or a panel of experts. In order to gain practical experience in trading at an early stage, spot trading could also be started before 2027. For this purpose, a share of the number of allowances planned to be issued in 2027 could simply already be auctioned in 2026. Unlike the frontloading mechanism, this would not affect allowance supply beyond 2027. In our evaluation, we refer to this option (*early auctions in 2026*).

3.1.2 Expansion of Frontloading

A mechanism called "frontloading" is planned for the start of the EU-ETS 2 (see above section 2.1.3). This means, the total number of allowances issued in the starting period in 2027 will be 30% higher than the planned amount calculated based on emission trajectories. In turn, the total quantity issued will be reduced accordingly between 2029 and 2031 to neutralise the effect on long-term EU-ETS 2 allowance supply.[125]

Both economic theory and practical experience with the EU-ETS 1 suggest that making a large quantity of emission allowances available at the start of trading can effectively limit initial allowance prices.[126] The frontloading of EU-ETS 2 allowances is a mechanism that has been adopted for this purpose. To further limit the price burden in the initial phase, the frontloading could be extended. This would result in a surcharge higher than the agreed 30% on the planned issuance volume in 2027. At the same time, annual issuance volumes would be reduced accordingly between 2029 and 2031.

[124] EEX (2025). EEX to list EU ETS2 Futures in July. European Energy Exchange.
[125] ETS Directive 2003/87/EC, Art. 30d.
[126] Venmans, F. (2012), A literature-based multi-criteria evaluation of the EU ETS. Renewable and Sustainable Energy Reviews, 16(8), 5493-5510.

3.1.3 Extension of the MSR Scope

600 million EU-ETS 2 emission allowances will be added to a newly created MSR in 2027 (see above section 2.1.3).[127] It is intended to mitigate politically undesired market developments, in particular a strong short-term rise in CO_2 prices, by adjusting allowance supply. It foresees four different kinds of triggers, each with its own prescription for the extent of intervention.

A possible permanent modification of the safeguard measures would be to change the role of the MSR. In principle, there are two types of modification that can be combined with each other. The first type involves adjusting the rules on the intended trigger points, i.e. the conditions under which allowances are redistributed between the MSR and the market. To strengthen the effectiveness of the MSR as a price stabilisation instrument, one approach would be to set the triggering conditions, particularly for releasing allowances from the MSR, at a lower threshold. Compared to the agreed rules, this could include the following three adjustments:

Option 1: setting the threshold for the price cap at less than (inflation-adjusted) 45 €/t CO_2,

Option 2: setting the thresholds for observed price increases at a lower level, and

Option 3: setting the threshold for the minimum number of allowances in circulation at a higher level.

Option 1 would probably have little effect, as the existing threshold is already very low compared to known EU-ETS 2 price forecasts. Options 2 and 3 may have a greater impact, as the existing conditions are formulated more restrictively. It is not clear a priori which of the two options represents the more far-reaching intervention. Option 2 is more directly linked to short-term price trends, while option 3 regulates the circulation volume as an important determinant of medium-term price trends.

A second type of modification would be to increase the quantity of additional allowances placed on the market in the event the MSR is triggered. This could require raising the total volume of additional allowances initially placed in the MSR. Different adjustments could also be made for the three types of existing triggers. Without market data, it is difficult to predict which adjustment would have the greatest impact on pricing. In general, strengthening the response to prices exceeding the inflation-adjusted 45 € could be particularly effective, as this trigger is most likely to be activated.

Against this background, we consider in the following evaluation two (isolated) types of modifications to the MSR as examples: a reduction in the necessary short-term price increase for releasing allowances (*lower threshold for price increase*) and an expansion of the released number of allowances when the inflation-adjusted 45 €/t price threshold is exceeded (*stronger intervention above threshold price)*.

3.1.4 Introduction of a Binding Price Ceiling

A more in-depth form of market intervention would involve measures aimed directly at regulating effective CO_2 prices for end consumers. The objective of preventing sharp price increases could be achieved through a one-sided price ceiling or, as in Germany's national emissions trading system (BEHG), through a price corridor. We are focusing on a price ceiling. Different design variants are conceivable. Firstly, this concerns the type of intervention. CO_2 prices could be regulated by adjusting the prices on the allowance market directly. Since market prices are formed through the interaction of

[127] ETS Directive 2003/87/EC, Art. 30d.

supply and demand, additional allowances would need to be released from the MSR if the maximum price were exceeded. Unlike the measures discussed in section 3.1.3, this action would not involve releasing a pre-defined quantity of allowances. Instead, there would be an obligation to intervene in the market by issuing additional allowances for as long and as strongly as necessary, until average prices within a period fall back to their designated maximum level.

A more indirect form of price intervention would not influence market price formation, but would instead adjust the actual CO_2 prices paid by end consumers. This could take the form of compensation payments to end consumers, compensating them for the difference between the average CO_2 price in the EU-ETS 2 and the ceiling price. Unlike the measures discussed in the context of the Social Climate Fund, this compensation would not be paid as a lump sum or be dependent on investment requirements. Rather, it would be proportional to the emissions contribution. Additional costs resulting from increased CO_2 prices would therefore be fully compensated, irrespective of consumption behaviour.

A second design issue concerns the process of determining the maximum price level. It could be defined by law at an absolute (inflation-adjusted) level to clearly limit the maximum burden. Alternatively, it could be linked to reference prices, enabling dynamic adjustment to changing framework conditions. Pahle et al. (2025) propose using the EU-ETS 1 price level as a benchmark for the maximum price. This would imply that the conditions for market interventions in the EU-ETS 2 would be directly linked to market development in the EU-ETS 1.[128]

In the following evaluation, we consider three design variants of price ceilings to illustrate the effects of the different dimensions of design options: *fixed price ceiling through ex-ante intervention, fixed price ceiling through ex-post compensation, EU-ETS 1-linked price ceiling through ex-ante intervention*.

3.1.5 Changes to Revenue Distribution Scheme

The Social Climate Fund (SCF) managed by the Commission is be created one year before introducing the EU-ETS 2 to enable immediate social support (see above section 2.1.4). In 2026, this will initially be financed from the revenue from 50 million allowances from the EU-ETS 1 (40 million allowances from the quantity that could otherwise be allocated free of charge and 10 million allowances from the quantity that would otherwise be auctioned).

From 2027 to 2032, revenues from EU-ETS 2 allowances will be allocated to the SCF. A maximum of 65 billion € will be made available to Member States through the SCF between 2026 and 2032 (approximately 25% of the expected revenues). Should the start of EU-ETS 2 be postponed until 2028, the maximum amount to be made available to the SCF would be 54.6 billion € until 2032. The fund is intended to promote the implementation of national Social Climate Plans. Country-specific upper limits determine the maximum amount of funds that Member States can withdraw. Funds are distributed among Member States based on factors such as CO_2 emissions per household, population at risk of poverty living in rural areas and total population per capita gross national income (GNI). Eligible measures within the Social Climate Plans include direct income support for disadvantaged households and transport users particularly affected by CO_2 pricing in the road transport and buildings sectors.

[128] Pahle, M. / Günther, C. / Feindt, S. / Edenhofer, O. (2025), Wie weiter mit dem ETS2? Vorschläge und Erwägungen zur Stärkung der Glaubwürdigkeit. Studie für die Konrad-Adenauer-Stiftung.

They also include measures and investments that provide financial support for disadvantaged households, micro-enterprises and transport users to switch from fossil to climate-friendly technologies.[129]

The remaining revenues shall remain with the Member States. Their distribution shall be based on reference emission values of the ESR (average emissions of the buildings and road transport sectors of the individual Member States for 2016-2018).[130]

The agreed distribution key for auction revenues has fuelled fears that poorer Member States, which tend to have a higher proportion of vulnerable population, will receive an insufficient share of the revenue to fund national support measures. This could further jeopardise the social acceptance of carbon pricing in these countries. This risk could be mitigated by redistributing the revenue towards poorer Member States. Modifications to the distribution rules could be implemented at various levels. Firstly, the distribution key for the money earmarked for the SCF could be changed. Specifically, national income and poverty risk could be given greater weight in the distribution formula. Secondly, the size of the SCF could be increased by raising the planned budget. This would mean that a larger proportion of total revenue would be distributed among Member States partly based on income and poverty indicators, and less on historical emissions. These would both constitute static forms of revenue reallocation, as neither would change the fixed cap on the SCF.

A dynamic form of reallocation would be to remove this cap and allocate the revenue from a specified quantity of auctioned allowances to the SCF without limit. If these allowances were distributed evenly over several years, the SCF's budget would grow in line with rising allowance prices.

3.2 Economic Evaluation

3.2.1 Evaluation Scheme

Any modification to the agreed trading rules could impact the behaviour of market participants and affected end consumers. Therefore, a modification must never be assessed solely in terms of its primary intention. Instead, an evaluation should reflect its impact on the functions and performance of the trading system. To this end, we use a scheme that evaluates the general core functions of emissions trading as an efficient mitigation instrument.

- **Allocative efficiency**: A key feature of emissions trading is the ability to achieve a specified emissions reduction target at minimum social abatement costs. This is achieved by concentrating emission rights via the free trade in allowances among actors with the highest abatement costs and thus the highest willingness to pay for allowances. Modifications are assessed according to their impact on this allocative efficiency.

- **Political control of cap**: By determining the quantity of allowances issued, policymakers have direct control over the total level of emissions from the activities covered by the trading system. This provides a direct link to existing long-term climate targets. Modifications are assessed according to the extent they weaken this form of political control.

- **Investment incentives**: The CO_2 price signals emerging from emissions trading can induce emitters to invest in climate-friendly technologies early on. This is particularly true if a reduction in issued

[129] SCF Regulation (EU) 2023/955.
[130] ETS Directive 2003/87/EC, Art. 30d.

allowances lets market participants expect allowance prices to increase over time. In turn, these investments reduce exposure to rising CO_2 prices, lowering the risk that emissions reductions are only achieved through severe behavioural restrictions. Modifications are assessed in terms of their impact on investment incentives.

In addition, we consider criteria that do not directly concern the core functions, but still affect the social costs of system implementation.

- **Long-term price predictability:** In addition to incentives for emitters, affordability is a key factor in the impact of emissions trading on investment in low-emission technologies. Uncertainty regarding the long-term development of CO_2 prices leads to uncertainty regarding expected investment returns, which can result in high financing costs. The modifications are assessed in terms of their impact on the long-term predictability of CO_2 price development.
- **Information needs of regulators:** An additional advantage of emissions trading systems compared to alternative mitigation instruments is the comparatively low information requirements imposed on regulators for system design. No ex-ante information on the costs of specific technologies is required. Modifications are assessed based on whether they increase the regulator's need for information (and thus the risk of wrong decisions due to insufficient information).
- **Cost burden on the most vulnerable groups:** A key motivation behind the current debate on social acceptance is the concern that placing an excessive cost burden on particularly vulnerable, low-income groups would lead to significant political opposition to the EU-ETS 2. Against this backdrop, we assess whether the proposed modifications are suitable for alleviating the cost burden on these groups.

3.2.2 Comparative Evaluation

In the following comparative evaluation, we refer to an isolated implementation of the modification in question, with other design features remaining unchanged (*ceteris paribus* scenario).

An early auctioning of the first allowances already in 2026 is a promising way to meet uncertainty of market participants. Early activity on the spot market allows upstream traders to gain experience with practical trading and provides first price signals to steer allowance demand. It thus helps emissions trading to perform its allocative function of emission rights. At the same time, it facilitates investment planning of downstream emitters. As it does not change the issuance of allowances beyond 2027, it does neither affect long-term political control of emission volumes nor the long-term predictability of allowance prices.

Expanding frontloading implies shifting more allowances forward during the early years after adoption. This likewise does not affect long-term emission reduction targets. However, effects on allowance price levels are to be expected. In the first period, an increase in the trading volume of allowances should dampen initial prices. The reduction in allowances issued in subsequent periods implies that steeper and more abrupt price increases can be expected. This contributes to overall price uncertainty. While the expectation of a steeper price increase could increase investment incentives, the lower initial price could also nourish a wait-and-see attitude. The effects on the cost burden of vulnerable groups are therefore uncertain and depend on the timeframe. While they would initially be better protected from prohibitive prices, they would also be likely to be most affected by subsequent price increases.

A modification of the MSR in the form of an increased release of allowances above the threshold price (inflation-adjusted 45 €/t) could curb investment incentives in climate-friendly technologies. It intensifies the price-dampening effect of the MSR, especially given that the allowances placed in the reserve add to the regular cap. At the same time, this also reduces political control over the effective quantity of emission allowances issued, as it would become more sensitive to the triggering of the reserve. Moreover, it is uncertain whether such a permanent price-dampening effect can contribute to the protection of vulnerable groups. With the effective cap being softened by additional allowances, the pressure on regulators to achieve the given political emission reduction targets through alternative instruments increases. Vulnerable groups in particular could be negatively affected by a greater use of command-and-control instruments, as they have little financial leeway for the short-term fulfilment of technology requirements.

The same reasoning can be applied to the various options for implementing a **binding price ceiling**. Moreover, they are likely to come with additional negative effects. If the price ceiling is enforced through interventions in allowance supply, this would not directly affect the allocative efficiency. However, it would further restrict political control over the number of emission allowances, as guaranteeing a maximum price would require releasing as much additional allowances from the reserve as needed. This could be avoided through an alternative ex-post compensation of energy users. However, this option entails the risk of a growing excess demand for allowances, which could not be resolved through incentives for end consumers to change behaviour, due to the presence of the maximum price. Therefore, such a modification would jeopardise the long-term stability and allocation function of the system.

Moreover, in the case of a fixed maximum price, determining a reasonable price level requires regulators to have information on the expected development of energy prices and income. The option of linking the maximum price to the development of the EU-ETS 1 price would make implementation easier, but would not contribute to a reduction of price uncertainty. The idea put forward by Pahle et al. (2025) that such a linkage would facilitate a subsequent integration of EU-ETS°1 and EU-ETS°2 is also not convincing. The link would need to be dissolved in the process of merging the two trading systems. Hence, it would not prevent sectors with particularly high abatement costs (e.g. the buildings sector) from suddenly becoming price-setters in an integrated system, potentially resulting in sharp jumps in the carbon price for all sectors included.

In contrast, the options presented for the **redistribution of auction revenues** avoid any direct influence on trade and therefore do not affect the core functions of the adopted system. Instead, they increase the scope for a direct financial compensation for those groups negatively affected by rising carbon prices beyond the market sphere. This allows to counter undesirable distributional effects that could threaten the political majority in favour of emissions trading, while avoiding the distortion of investment and consumption decisions.

Table 1: Economic evaluation of modification options for the EU-ETS 2

	Evaluation criterion		
Modification option	**Allocative efficiency**	**Political control of cap**	**Investment incentives**
Early auctions in 2026	Increased	Neutral	Increased
Enhanced frontloading	Neutral	Neutral	Uncertain
MSR: Lower thresholds for price increase	Neutral	Slightly reduced	Neutral
MSR: Stronger intervention above threshold price	Neutral	Slightly reduced	Reduced
Price ceiling: fixed, direct intervention	Neutral	Reduced	Reduced
Price ceiling: fixed, ex-post compensation	Endangered	Neutral	Reduced
Price ceiling: ETS 1-linked, direct intervention	Neutral	Reduced	Reduced
Revenue distribution: static reallocation towards poor Member States	Neutral	Neutral	Neutral
Revenue distribution: dynamic reallocation towards poor Member States	Neutral	Neutral	Neutral
Modification option	**Long-term price predictability**	**Information needs regulators**	**Cost burden on most vulnerable groups**
Early auctions in 2026	Neutral	Neutral	Neutral
Enhanced frontloading	Reduced	Neutral	Uncertain
MSR: Lower thresholds for price increase	Neutral	Neutral	Neutral
MSR: Stronger intervention above threshold price	Neutral	Neutral	Uncertain
Price ceiling: fixed, direct intervention	Slightly increased	Increased	Uncertain
Price ceiling: fixed, ex-post compensation	Slightly increased	Increased	Uncertain
Price ceiling: ETS 1-linked, direct intervention	Uncertain	Neutral	Uncertain
Revenue distribution: static reallocation towards poor Member States	Neutral	Neutral	Temporarily reduced (with targeted use of funds)
Revenue distribution: dynamic reallocation towards poor Member States	Neutral	Neutral	Reduced (with targeted use of funds)

Source: own illustration

In summary, modifications that affect the market design (frontloading, MSR and price ceilings) jeopardise several core functions of the adopted emissions trading system to varying degrees. At the same time, their desired effect — providing cost relief for particularly vulnerable groups — is highly uncertain in long-term perspective.

4 Conclusion

Europe's climate policy is at a critical juncture. High energy prices and insufficient political efforts to ensure a fair distribution of the economic burden of the green transition have strengthened political opposition. This is currently manifesting itself in calls for an abolishment, postponement or at least some sort of modification of the emissions trading system for the road transport and buildings sectors (EU-ETS°2). Many Member States are particularly concerned that its planned introduction in 2027 will very quickly lead to high CO_2 prices, which will make already high-priced fossil fuels for road transport and heating even more expensive.

However, legitimate political concerns about the social acceptance of climate policy are not a reason to abandon its most effective and cost-efficient tool: emissions trading. The analysis of this cepStudy of the regulatory design, implementation status, and expected economic effects of the EU-ETS 2 demonstrates that this instrument is indispensable for the climatically effective and economically cost-effective achievement of EU climate targets in the road transport and buildings sectors. By setting an overall cap on the maximum amount of allowed GHG emissions and reducing it gradually, the EU-ETS 2 is the most effective instrument for safely attaining the targeted emissions reductions and achieving the climate target in the covered sectors in comparison to other policy approaches, e.g. command-and-control requirements. Furthermore, the EU-ETS 2 uses price signals to steer the market towards climate-friendly technologies also for heavy-duty transport. The tradeable EU-ETS 2 allowance creates a uniform carbon price which equalises the costs of additional GHG emissions in the sectors covered, thereby allowing for the automatic identification and realisation of the most cost-efficient GHG avoidance options. This cost-minimising effect of the EU-ETS 2 also renders it ultimately more socially fair than alternative solutions, such as technology bans or expensive subsidies. Modifications currently being discussed, such as expanding the role of the market stability reserve, would undermine its core functions and hinder social acceptance in the long term. This is because, given the existing climate targets, weakening emissions trading would force politicians to introduce even tougher command-and-control measures in the long term, which would disproportionately affect lower-income groups.

Therefore, the necessary steps to resolve the current political pressure on the EU-ETS 2 must not be weakening or even abolishing emissions trading in the road transport and buildings sector, but should rather be the consistent implementation of market-neutral compensation mechanisms. In this respect, the Social Climate Fund provides Member States with necessary, although not sufficient means to ensure that the energy transition is socially acceptable. Political efforts should therefore focus on strengthening the role of such support mechanisms in alleviating undesirable social hardship.

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